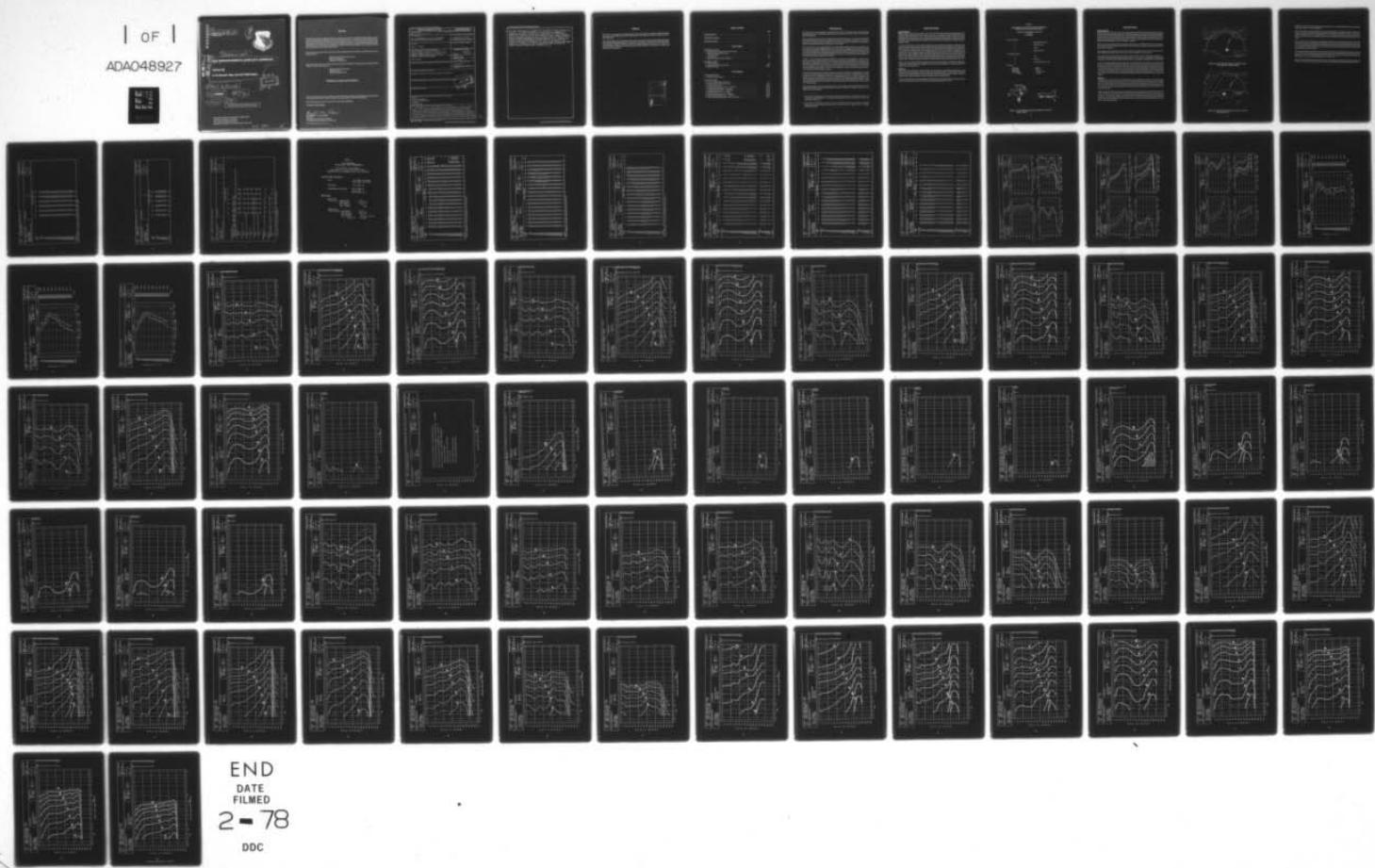


AD-A048 927 AEROSPACE MEDICAL RESEARCH LAB WRIGHT-PATTERSON AFB OHIO F/G 20/1  
USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK. VOLUME 80. A-7D AIRC--ETC(U)  
FEB 77 R G POWELL  
AMRL-TR-75-50-VOL-80

UNCLASSIFIED

NL

| OF |  
ADA048927



END  
DATE  
FILED  
2 - 78  
DDC

ADA 048927

AU NO.  
DDC FILE COPY

AMRL-TR-75-50-VOL-8P  
Volume 80

(14)

2 NW

AMRL-TR-75-50-VOL-8P

(9) Technical rept.

USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK

(6)

Volume 80.

A-7D Aircraft, Near and Far-Field Noise

(10) Robert G. Powell

(11) FEB [REDACTED] 77

(12) 84 P.

(16) 7231

(17) 04

Approved for public release; distribution unlimited.

DDC  
REF ID: A65112  
JAN 26 1978  
F

AEROSPACE MEDICAL RESEARCH LABORATORY  
AEROSPACE MEDICAL DIVISION  
AIR FORCE SYSTEMS COMMAND  
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

009 850 mt

## **NOTICES**

When US Government drawings, specifications, or other data are used for any purpose other than a definitely related Government procurement operation, the Government thereby incurs no responsibility nor any obligation whatsoever, and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data, is not to be regarded by implication or otherwise, as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

Please do not request copies of this report from Aerospace Medical Research Laboratory. Additional copies may be purchased from:

National Technical Information Service  
5285 Port Royal Road  
Springfield, Virginia 22161

Federal Government agencies and their contractors registered with Defense Documentation Center should direct requests for copies of this report to:

Defense Documentation Center  
Cameron Station  
Alexandria, Virginia 22314

## **TECHNICAL REVIEW AND APPROVAL**

This report has been reviewed by the Information Office (OI) and is releasable to the National Technical Information Service (NTIS). At NTIS, it will be available to the general public, including foreign nations.

This technical report has been reviewed and is approved for publication.

### **FOR THE COMMANDER**

*H. E. von Gierke*  
HENNING E. VON GIERKE  
Director  
Biodynamics and Bionics Division  
Aerospace Medical Research Laboratory

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

| REPORT DOCUMENTATION PAGE   |                       | READ INSTRUCTIONS BEFORE COMPLETING FORM  |
|---|-----------------------|---|
| 1. REPORT NUMBER<br>AMRL-TR-75-50, Vol. 80  | 2. GOVT ACCESSION NO. | 3. RECIPIENT'S CATALOG NUMBER   |
| 4. TITLE (and Subtitle)<br><br>USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK:<br>A-7D Aircraft, Near and Far-Field Noise  |                       | 5. TYPE OF REPORT & PERIOD COVERED<br><br>Volume 80 of a series   |
| 7. AUTHOR(s)<br><br>Robert G. Powell  |                       | 6. PERFORMING ORG. REPORT NUMBER  |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS<br>Aerospace Medical Research Laboratory<br>Aerospace Medical Division, Air Force Systems<br>Command, Wright-Patterson AFB, OH 45433  |                       | 10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS<br><br>7231-04-33<br>62202F      7231-04-36 |
| 11. CONTROLLING OFFICE NAME AND ADDRESS<br><br>Same as above  |                       | 12. REPORT DATE<br><br>February 1977  |
|   |                       | 13. NUMBER OF PAGES<br><br>84   |
| 14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)   |                       | 15. SECURITY CLASS. (of this report)<br><br>Unclassified  |
|   |                       | 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE  |
| 16. DISTRIBUTION STATEMENT (of this Report)<br><br>Approved for public release; distribution unlimited  |                       |   |
| 17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)  |                       |   |
| 18. SUPPLEMENTARY NOTES   |                       |   |
| 19. KEY WORDS (Continue on reverse side if necessary and identify by block number)<br>Noise<br>Noise Environments<br>Bioenvironmental Noise<br>Aircraft<br>A-7D Aircraft  |                       |   |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number)<br><br>The USAF A-7D is a close support aircraft powered by a TF41-A1 turbofan engine. This report provides measured and extrapolated data defining the bioacoustic environments produced by this aircraft operating on a concrete runup pad for three engine/power configurations. Near-field data are reported for four locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times |                       |   |

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 19 locations are normalized to standard meteorological conditions and extrapolated from 75-8000 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distances from the source. Refer to Volume 1 of this handbook, ~~USAF Bioenvironmental Noise Data Handbook~~, Vol 1: Organization, Content and Application, AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing definitions of quantities, symbols, equations, applications, limitations, etc.

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

## PREFACE

This report was prepared by the Biodynamic Environment Branch, Aerospace Medical Research Laboratory, under Project/Task 723104, Measurement and Prediction of Noise Environments of Air Force Operations.

The author gratefully acknowledges Mr. John Cole for his assistance in preparing this report, Col Justus Rose and Mr. Robert England for their assistance in acquiring the raw data, Mr. Keith Kettler, Mr. Henry Mohlman and Mr. David Eilerman of the University of Dayton for assistance in the mechanics of data processing, and Mrs. Norma Peachey and Mr. Mike Patterson for assistance in typing and preparation of the graphics.

|                                 |   |
|---------------------------------|---|
| ACCESSION for                   |   |
| NTIS                            | White Section <input checked="" type="checkbox"/> |
| DOC                             | Buff Section <input type="checkbox"/>             |
| UNANNOUNCED                     | <input type="checkbox"/>                          |
| JUSTIFICATION _____             |   |
| BY _____                        |   |
| DISTRIBUTION/AVAILABILITY CODES |   |
| Dist.                           | SPECIAL   |
| A                               |   |

## Table of Contents

|                        | <i>Page</i> |
|------------------------|-------------|
| INTRODUCTION .....     | 3           |
| NEAR-FIELD NOISE ..... | 4           |
| FAR-FIELD NOISE .....  | 6           |

## List of Tables

|  |       |
|--|-------|
| NEAR-FIELD NOISE                                   |       |
| 1. Measurement Locations and Test Conditions ..... | 5     |
| 2. Measured Sound Pressure Level                   |       |
| 1/3 Octave Band .....                              | 9     |
| Octave Band .....                                  | 10    |
| 3. Measures of Human Noise Exposure .....          | 11    |
| FAR-FIELD NOISE                                    |       |
| 4. Test Conditions .....                           | 12    |
| 5. Measured Sound Pressure Level .....             | 13-15 |
| 6. Directivity Index .....                         | 16-18 |

## List of Figures

|   |       |
|---|-------|
| NEAR-FIELD NOISE                                      |       |
| 1. Measurement Locations .....                        | 5     |
| FAR-FIELD NOISE                                       |       |
| 2. (a and b) Measurement Locations .....              | 7     |
| 3. Normalized Far-Field Noise Levels .....            | 19-21 |
| 4. Acoustic Power Level .....                         | 22-24 |
| 5. Overall Sound Pressure Level — Contours .....      | 25-27 |
| 6. C-Weighted Sound Level — Contours .....            | 28-30 |
| 7. A-Weighted Sound Level — Contours .....            | 31-33 |
| 8. Perceived Noise Level — Contours .....             | 34-36 |
| 9. Speech Interference Level — Contours .....         | 37-39 |
| 10. Permissible Exposure Time — Contours .....        | 40-53 |
| 11. Octave Band Sound Pressure Level — Contours ..... | 54-80 |

## INTRODUCTION

The USAF A-7D is a close support aircraft powered by a TF41-A1 turbofan engine. The aircraft was manufactured by the LTV Aerospace Corporation and the engine by the Allison Division of the General Motors Corporation.

This volume provides measured and extrapolated data defining bioacoustic environments produced by this aircraft during ground runup operations. Such data are essential to evaluate ear protection requirements, limiting personnel exposure times, voice communication capabilities, and annoyance problems associated with ground runups of the A-7D aircraft.

This volume is one of a series published by the Aerospace Medical Research Laboratory (AMRL) under the same report number (AMRL-TR-75-50) as a multi-volume handbook that quantifies the noise environments produced at flight/ground crew locations and in surrounding communities by operations of Air Force aircraft and ground support equipment. The far-field, community-type, noise data in the handbook describe the noise produced during *ground operations* of aircraft, ground support equipment, and other ground-based equipment or facilities.

Volume 1 of this handbook discusses the objectives and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. Volume 2 provides a method and data for adjusting the handbook's far-field noise data, which are for standard meteorological conditions (15°C temperature, 70% rel humidity, 0.760 meters Hg barometric pressure), to derive comparable data for other meteorological conditions. Refer to Volumes 1 and 2 (references 2 and 3) for such information because it is not repeated in other handbook volumes.

A cumulative index lists those aerospace systems contained in the handbook, and identifies the specific volumes containing each type of environmental noise data available (i.e., inflight/flight crew and passenger noise, near-field/ground crew noise, far-field/community noise). Volume numbers are assigned sequentially as individual volumes are published. This index is periodically updated as individual volumes are published and is available upon request from AMRL/BBE, Wright-Patterson AFB, OH 45433. Organizations on the distribution list for the handbook will automatically receive a copy of each updated index.

Direct any questions concerning the technical data in this report and other handbook volumes to: AMRL/BBE, Wright-Patterson AFB, OH 45433; AUTOVON 78-53675 or 78-53664; Commercial (513) 255-3675 or (513) 255-3664.

- 
1. Cole, John N., *USAF Bioenvironmental Noise Data Handbook Volume 1: Organization, Content and Application*, AMRL-TR-75-50 (1), Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, 1975.
  2. Cole, John N., *USAF Bioenvironmental Noise Data Handbook, Volume 2: Procedure to Evaluate Effects of Non-standard Meteorological Conditions on Far-Field Noise*, AMRL-TR-75-50 (2), AMRL, WPAFB, OH, 1975.

## **NEAR-FIELD NOISE**

### **MEASUREMENTS**

AMRL acquired near-field noise data on the A-7D aircraft during ground runup operations of its turbofan engine. For these tests the aircraft was located on a concrete runup pad at Eglin AFB with no significant reflecting surfaces in the vicinity except the ground plane. Table 1 gives the surface meteorological conditions and the three engine/power conditions. The ground-crew chief selected power conditions and near-field locations generally used during routine maintenance or engine runup for preflight checks.

At each near-field location a test engineer randomly moved a hand-held microphone in and around each location, probing all areas where a crew member's head would normally be located. He recorded all the noise samples on magnetic tape. During analysis of each sample, he determined the octave band root-mean-square sound pressure 4- or 8-sound integration time to derive a power-averaged level for each location. Figure 1 shows the four near-field locations where ground crews are usually located for maintenance and/or preflight checkout operations. Estimates of noise levels at other locations are difficult in the near-field since the noise source is spatially distributed i.e., not a point source. The noise levels at near-field locations can vary widely depending upon relative distances from each noise source (intake noise, exhaust noise, panel resonances, internal engine noise through the engine wall, etc).

Table 1 lists the numeric/alphabetic designators used on the data pages in this report to identify the measurement locations and test conditions. For example, the designator 1/A means ground crew location 1 and test condition A.

### **RESULTS**

The measured data presented in Table 2 define the sound pressure levels (SPL) produced by the A-7D aircraft at the four ground crew locations. This table includes the overall, 1/3 octave band, and octave band levels. From these data one can calculate the variety of measures given in Table 3, which are widely used to assess the effects of noise on personnel and their performance.

All near-field data are for the meteorological conditions at the time of test but are valid for all typical airbase meteorology because of the short sound propagation distances involved.

TABLE 1

**MEASUREMENT LOCATIONS AND TEST CONDITIONS  
FOR NEAR-FIELD NOISE MEASUREMENTS**

**A-7D Aircraft, Ground Runup, Eglin AFB**  
**11 Aug 71**  
**Tail # 88221**

*Ground Crew Location*

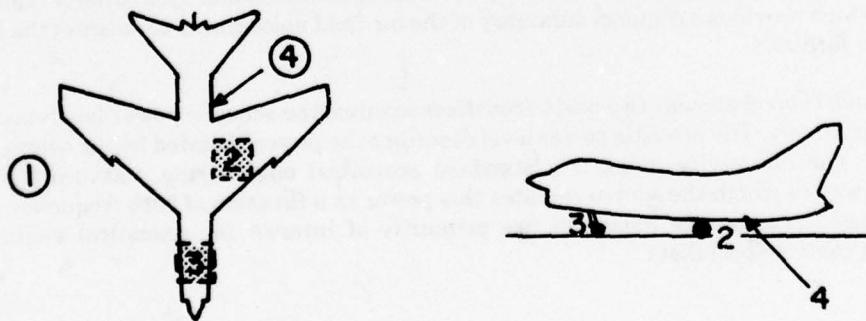
|   |                          |
|---|--------------------------|
| 1 | Engine Start, Fire Guard |
| 2 | Wheel Chock Pull         |
| 3 | Pin Pull                 |
| 4 | Engine Trim Panel        |

*Aircraft Engine Operation*

|   |                               |
|---|-------------------------------|
| A | Idle                          |
| B | 85% RPM                       |
| C | Intermediate (Military) Power |

*Meteorology*

|              |                  |
|--------------|------------------|
| Temperature  | 26.7 C           |
| Bar Pressure | 0.758 M Hg       |
| Rel Humidity | 83 %             |
| Wind — Speed | 2.1 M/Sec (4 kt) |
| — Direction  | 320 Deg          |



**Figure 1. Near-Field Measurement Locations at Trim Pad  
Eglin AFB FL**

## FAR-FIELD NOISE

### MEASUREMENTS

AMRL acquired far-field data during 1-hour test periods at both Edwards and Eglin AF bases. Figure 2 shows the ground runup pads, ground cover, aircraft orientation and the 19 microphone measurement sites on each semicircle. The centers of the 75 meter radius semicircles used in surveying the TF41-A1 engines were on the ground directly below the intersection of the aircraft's centerline and the plane passing through the engine's exhaust-nozzle exit. The ground runup pads did not have blast deflectors; therefore, the jet exhausts were in a "free-flow" condition.

Table 4 provides cockpit readouts of some engines characteristics (% RPM, fuel flow, etc.) for each power setting used in the far-field tests. Also listed in this table are the surface meteorological conditions during data acquisition.

All microphone measurement sites are in the acoustic far-field of the source where the sound wave-fronts spherically diverge and the noise source may be regarded as a point source.

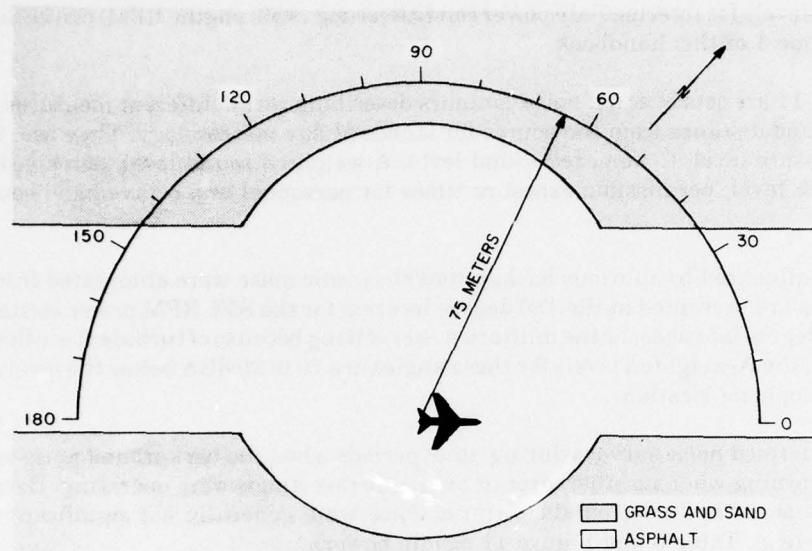
Test personnel acquired far-field noise data at Eglin AFB by using a hand-held microphone (1.7 meters/5½ feet above the ground plane and pointed at the noise source, 0° incidence) and sequentially recording 5-10 seconds of data at each far-field location on a portable microphone/tape recorder system.

A similar microphone/tape-recorder system was used to sequentially record the noise at each far-field location at Edwards AFB. However, at Edward's the microphone was attached to a hand-held pole, pointed at the source (0° angle of incidence) and vertically scanned from 0.5 to 3 meters for a period of 5-10 seconds during data acquisition at each microphone location. Both Eglin's and Edward's samples were then time-integrated to derive a root-mean-square sound pressure level. Vertical scanning and time-integrating together reduce anomalies frequently present in data acquired by a fixed height microphone and now constitute the standard far-field data acquisition/reduction technique used by the AMRL.

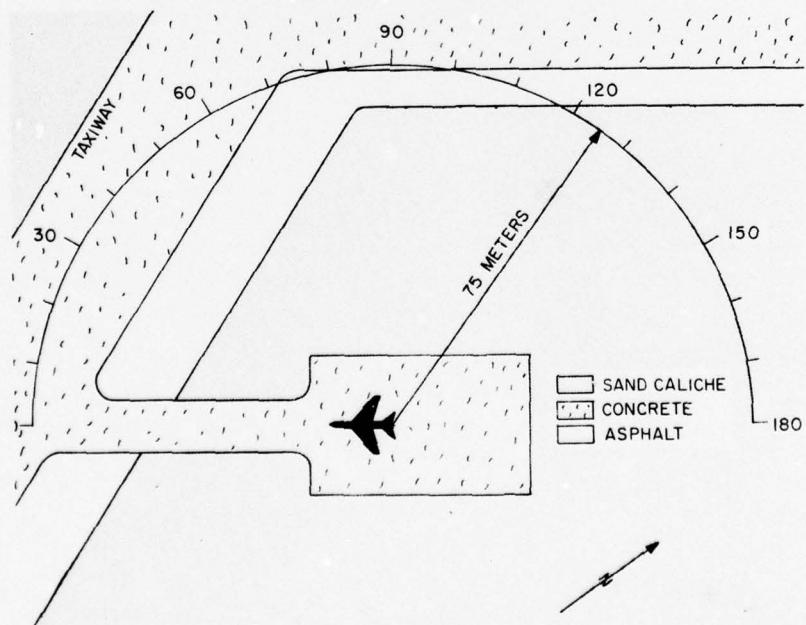
### RESULTS

Table 5 lists the overall and 1/3 octave band SPL measured at the far-field locations under meteorological conditions at the time of the test. Data in all other figures and tables are based on these levels. These data were normalized to 100 meters distance and standard meteorological conditions (15°C temperature, 70% relative humidity, 0.760 meter Hg barometric pressure) and used to derive the graphic data in Figure 3 which provides a compact summary of the far-field noise characteristics of the A-7D aircraft in a standard format.

Figure 4 and Table 6 present two basic acoustic measures, the acoustic power levels and the directivity index, respectively. The acoustic power level describes the power radiated by the source as a function of frequency. The directivity index is a standard acoustical engineering measure that describes the geometric way in which the source radiates this power as a function of both frequency and angle from source. These basic source measures are primarily of interest for acoustical engineers and noise generation/control specialists.



**Figure 2(a). Far-Field Measurement Locations at the Hot Cargo Pad, Eglin AFB FL**



**Figure 2(b). Far-Field Measurement Locations at Pad 17 Edwards AFB CA**

Estimates of noise levels for intermediate power conditions (e.g., 88% engine RPM) can be determined as explained in Volume 1 of this handbook.

Figures 5 through 11 are sets of equal noise contours describing seven different measures of noise as a function of angle and distance from the source for standard day meteorology. They are, respectively, overall sound pressure level, C-weighted sound level, A-weighted sound level, perceived noise level, speech interference level, permissible exposure times for personnel and octave band sound pressure levels.

Data excessively influenced by spurious background/electronic noise were eliminated from all figures and tables. No data are presented at the 180 degree location for the 85% RPM power setting and at the 160, 170, and 180 degree locations for the military power setting because of turbulent air flow behind the aircraft. Typically, the A-weighted levels for these angles are 10 to 20 dBA below the level measured at the preceding microphone location.

Test personnel performed noise surveys during quiet periods when the background noise was minimal, e.g., early in the morning when no other aircraft or engine test stands were operating. Data eliminated because they were near the background/electronic noise were generally not significant because the levels were so low (e.g., Table 5 and Figure 11 at idle power).

Volume 2 of the handbook describes the influence of meteorology on far-field noise environments, and provides, if required, the factors necessary to adjust the handbook's standard meteorological day data.

TABLE 2 MEASURED SOUND PRESSURE LEVEL (DB)  
1/3 OCTAVE BAND

| NOISE SOURCE/SUBJECT:   | OPERATION: | LOCATION/CONDITION |     |     |     |     |     |
|-------------------------|------------|--------------------|-----|-----|-----|-----|-----|
|                         |            | 1/A                | 2/A | 3/A | 4/A | 4/B | 4/C |
| A-7D AIRCRAFT           |            | 93                 | 88  | 83  | 86  | 90  | 96  |
| GROUND CREW             |            | 96                 | 96  | 90  | 87  | 91  | 95  |
| NEAR FIELD NOISE LEVELS |            | 90                 | 97  | 87  | 92  | 94  | 98  |
|                         |            | 88                 | 88  | 92  | 97  | 96  | 99  |
|                         |            | 89                 | 90  | 97  | 105 | 98  | 104 |
| 63                      |            | 89                 | 90  | 98  | 100 | 99  | 103 |
| 80                      |            | 89                 | 90  | 85  | 92  | 104 | 108 |
| 100                     |            | 91                 | 89  | 85  | 94  | 104 | 111 |
| 125                     |            | 96                 | 94  | 88  | 94  | 104 | 111 |
| 160                     |            | 94                 | 92  | 83  | 90  | 106 | 114 |
| 200                     |            | 88                 | 89  | 82  | 89  | 104 | 113 |
| 250                     |            | 85                 | 87  | 81  | 88  | 103 | 111 |
| 315                     |            | 85                 | 84  | 78  | 86  | 105 | 115 |
| 400                     |            | 85                 | 87  | 81  | 85  | 105 | 119 |
| 500                     |            | 89                 | 99  | 90  | 90  | 105 | 125 |
| 630                     |            | 84                 | 86  | 83  | 86  | 105 | 125 |
| 800                     |            | 80                 | 85  | 81  | 85  | 105 | 123 |
| 1000                    |            | 86                 | 90  | 85  | 87  | 103 | 120 |
| 1250                    |            | 94                 | 97  | 98  | 92  | 101 | 118 |
| 1600                    |            | 83                 | 87  | 87  | 88  | 102 | 117 |
| 2000                    |            | 84                 | 95  | 90  | 88  | 102 | 116 |
| 2500                    |            | 84                 | 87  | 88  | 86  | 106 | 115 |
| 3150                    |            | 83                 | 85  | 84  | 84  | 103 | 114 |
| 4000                    |            | 84                 | 86  | 83  | 82  | 101 | 111 |
| 5000                    |            | 83                 | 86  | 81  | 81  | 100 | 109 |
| 6300                    |            | 84                 | 87  | 83  | 81  | 99  | 109 |
| 8000                    |            | 84                 | 86  | 83  | 81  | 100 | 109 |
| 10000                   |            | 83                 | 83  | 78  | 79  | 99  | 108 |
| OVERALL                 |            | 104                | 106 | 104 | 108 | 117 | 131 |

LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

| TABLE: MEASURED SOUND PRESSURE LEVEL (DB) |      | IDENTIFICATION:    |     |     |     |     |
|---|------|--------------------|-----|-----|-----|-----|
| 2 OCTAVE BAND                             |      | TEST 71-019-1-00   |     |     |     |     |
| NOISE SOURCE/SUBJECT:                     |      | OPERATION:         |     |     |     |     |
| A-70 AIRCRAFT                             |      |                    |     |     |     |     |
| GROUND CREW                               |      |                    |     |     |     |     |
| NEAR FIELD NOISE LEVELS                   |      |                    |     |     |     |     |
|   |      | LOCATION/CONDITION |     |     |     |     |
| FREQ                                      | (HZ) | 1/A                | 2/A | 3/A | 4/A | 4/B |
| 31.5                                      |      | 98                 | 100 | 92  | 93  | 96  |
| 63  |      | 93                 | 94  | 101 | 106 | 107 |
| 125                                       |      | 99                 | 97  | 91  | 97  | 109 |
| 250                                       |      | 91                 | 92  | 85  | 93  | 109 |
| 500                                       |      | 91                 | 100 | 91  | 92  | 109 |
| 1000                                      |      | 95                 | 94  | 98  | 94  | 108 |
| 2000                                      |      | 88                 | 96  | 93  | 92  | 109 |
| 4000                                      |      | 88                 | 90  | 88  | 87  | 106 |
| 8000                                      |      | 83                 | 90  | 86  | 85  | 104 |
| OVERALL                                   |      | 104                | 105 | 104 | 108 | 117 |
|   |      |                    |     |     |     | 131 |

TABLE I: MEASURES OF HUMAN NOISE EXPOSURE

| TABLE: MEASURES OF HUMAN NOISE EXPOSURE  |     | IDENTIFICATION:                  |     |
|--|-----|----------------------------------|-----|
| 3  |     | NOISE SOURCE/SUBJECT: OPERATION: |     |
| A-70 AIRCRAFT GROUND CREW  |     | C                                |     |
| NEAR FIELD NOISE LEVELS  |     | C                                |     |
|  |     |                                  |     |
|  |     | LOCATION/CONDITION               |     |
|  |     | 1/A                              | 2/A |
|  |     | 3/A                              | 4/A |
|  |     | 4/B                              | 4/C |
| HAZARD/PROTECTION  |     |                                  |     |
| C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DBC) AT EAR                                   |     |                                  |     |
| A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DBA) AT EAR                                   |     |                                  |     |
| MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73) |     |                                  |     |
| NO PROTECTION  |     |                                  |     |
| OASLC  | 103 | 105                              | 107 |
| OASLA  | 98  | 103                              | 101 |
| T  | 42  | 1.8                              | 25  |
| MINIMUM OPL EAR MUFFS  | 79  | 81                               | 79  |
| CASLA*   | 960 | 807                              | 960 |
| T  |     |                                  | 571 |
| AMERICAN OPTICAL 1700 EAR MUFFS  | 74  | 76                               | 75  |
| OASLA*   | 960 | 960                              | 960 |
| T  |     |                                  | 80  |
| V-51R EAR PLUGS  | 73  | 77                               | 75  |
| CASLA*   | 960 | 960                              | 960 |
| T  |     |                                  | 74  |
| AMERICAN OPTICAL 1700 EAR MUFFS PLUS   | 61  | 64                               | 63  |
| OASLA*   | 960 | 960                              | 960 |
| T  |     |                                  | 63  |
| H-133 GROUND COMMUNICATION UNIT  | 72  | 75                               | 74  |
| CASLA*   | 960 | 960                              | 960 |
| T  |     |                                  | 75  |
| COMMUNICATION PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB)                         | 91  | 98                               | 94  |
| PSIL   |     |                                  | 93  |
| ANNOUNCEMENT PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB)                      | 115 | 120                              | 117 |
| TONE CORRECTION (C IN DB)  | 3   | 4                                | 4   |
| PNLT   |     |                                  | 114 |
| C  |     |                                  | 1   |
| P ADDITIONAL SPL SPECTRUM UNDER PROTECTIVE DEVICE.                                     |     |                                  | 130 |
| *  |     |                                  | 142 |
| P ADDITIONAL EAR PROTECTION REQUIRED.  |     |                                  | 101 |
|  |     |                                  | 240 |
|  |     |                                  | 25  |
|  |     |                                  | 125 |

TABLE 4

TEST CONDITIONS  
FOR FAR-FIELD NOISE MEASUREMENTS

A-7D Aircraft, Ground Runups  
Eglin AFB FL, 23 July 1971, Tail # 88221  
Edwards AFB CA, 25 September 1972, Tail # 6714584

Aircraft Engine Operation

|                         |   |
|-------------------------|---|
| Idle                    | 54 % RPM, Core Speed<br>950 LBS/HR, Fuel Flow   |
| 85% Runup               | 85 % RPM, NC                                    |
| Intermediate (Military) | 99.5 % RPM, NC<br>574 C, EGT<br>8200 LBS/HR, FF |

Meteorology

|                               |              |                   |
|-------------------------------|--------------|-------------------|
| Eglin AFB<br>(Idle, 85%)      | Temperature  | 22.2 C            |
|                               | Bar Pressure | 0.760 M Hg        |
|                               | Rel Humidity | 84 %              |
|                               | Wind - Speed | Calm              |
| Edwards AFB<br>(Intermediate) | Temperature  | 20.0 C            |
|                               | Bar Pressure | 0.700 M Hg        |
|                               | Rel Humidity | 65 %              |
|                               | Wind - Speed | 5.1 M/Sec (10 Kt) |
|                               | - Direction  | 260 Deg           |

TABLE: MEASURED SOUND PRESSURE LEVEL (dB)

**5** DISTANCE = 75 METERS

| NOISE SOURCE/SUBJECT: |     | OPERATION: |         |           | METEOROLOGY: |                        |                  |                |        |           |        |     |     |     |     |     | IDENTIFICATIONS: |     |     |
|-----------------------|-----|------------|---------|-----------|--------------|------------------------|------------------|----------------|--------|-----------|--------|-----|-----|-----|-----|-----|------------------|-----|-----|
|                       |     | IDLE       | 54% RPM | FREE FLOW | TEMP = 22 C  | BAR PRESS = .760 MM HG | REL HUMID = 84 % | TEST 75-02-004 | RUN 01 | 06 MAY 75 | PAGE 2 |     |     |     |     |     |                  |     |     |
| FREQ (HZ)             | 0   | 10         | 20      | 30        | 40           | 50                     | 60               | 70             | 80     | 90        | 100    | 110 | 120 | 130 | 140 | 150 | 160              | 170 | 180 |
| 25                    | 68< | 70<        | 68<     | 69<       | 70<          | 68<                    | 67<              | 68<            | 73<    | 71<       | 69<    | 66< | 66< | 69< | 72< | 72< | 74<              | 74< | 72< |
| 31.5                  | 73< | 75<        | 72<     | 70<       | 71<          | 68<                    | 72<              | 72<            | 77     | 75<       | 74<    | 74< | 72< | 72< | 76< | 76< | 77               | 75< | 74< |
| 40                    | 75< | 76<        | 75<     | 75<       | 75<          | 75<                    | 72<              | 78             | 77     | 75        | 79     | 77  | 78  | 78  | 79  | 81  | 81               | 78  | 76  |
| 50                    | 78  | 78         | 77      | 77        | 75           | 72<                    | 78               | 77             | 75     | 79        | 77     | 78  | 80  | 82  | 82  | 83  | 83               | 81  | 74  |
| 63                    | 73< | 73<        | 76<     | 81        | 81           | 81                     | 84               | 84             | 79     | 79        | 81     | 81  | 82  | 83  | 83  | 83  | 83               | 77< | 71< |
| 80                    | 75  | 75         | 80      | 79        | 79           | 82                     | 81               | 83             | 81     | 83        | 81     | 82  | 83  | 84  | 84  | 84  | 81               | 80  | 71< |
| 100                   | 75  | 75         | 74<     | 75<       | 74<          | 74<                    | 74<              | 74<            | 79     | 73<       | 74<    | 76  | 72< | 75  | 75  | 78  | 78               | 76  | 72< |
| 125                   | 77  | 77         | 72<     | 78        | 78           | 74                     | 78               | 78             | 76     | 79        | 78     | 79  | 79  | 80  | 80  | 82  | 83               | 80  | 75  |
| 160                   | 73  | 73         | 67<     | 73        | 73           | 70<                    | 73               | 73             | 73     | 73        | 73     | 74  | 75  | 74  | 76  | 76  | 78               | 79  | 74  |
| 200                   | 69< | 70<        | 64<     | 69<       | 71<          | 68<                    | 70<              | 71<            | 73     | 72<       | 72<    | 72< | 74  | 76  | 76  | 75  | 75               | 71< | 63< |
| 250                   | 64< | 65<        | 66<     | 66<       | 65<          | 65<                    | 67<              | 68<            | 71     | 70<       | 69<    | 70< | 72  | 74  | 72  | 72  | 72               | 72  | 67< |
| 315                   | 66  | 66         | 67      | 65        | 69           | 68                     | 68               | 68             | 68     | 68        | 69     | 70  | 72  | 73  | 75  | 73  | 73               | 73  | 68  |
| 400                   | 69  | 70         | 69      | 70        | 69           | 71                     | 69               | 68             | 69     | 70        | 71     | 73  | 75  | 76  | 77  | 76  | 76               | 76  | 75  |
| 500                   | 69  | 69         | 69      | 71        | 72           | 69                     | 72               | 73             | 73     | 73        | 74     | 74  | 76  | 76  | 77  | 76  | 76               | 70  | 53  |
| 630                   | 69  | 69         | 68      | 69        | 68           | 67                     | 67               | 65             | 66     | 66        | 68     | 70  | 73  | 76  | 75  | 71  | 68               | 51< | 51< |
| 800                   | 68  | 68         | 68      | 70        | 68           | 65                     | 65               | 66             | 66     | 66        | 69     | 71  | 73  | 77  | 76  | 71  | 68               | 53< | 53< |
| 1000                  | 71  | 70         | 70      | 70        | 67           | 66                     | 66               | 63             | 64     | 65        | 68     | 71  | 73  | 72  | 70  | 68  | 54               | 54  | 54  |
| 1250                  | 66  | 78         | 83      | 77        | 83           | 82                     | 82               | 76             | 73     | 68        | 71     | 74  | 74  | 73  | 71  | 69  | 61               | 44< | 44< |
| 1600                  | 71  | 69         | 69      | 70        | 71           | 72                     | 69               | 66             | 66     | 70        | 73     | 77  | 75  | 72  | 71  | 68  | 56               | 56  | 56  |
| 2000                  | 73  | 74         | 74      | 76        | 71           | 71                     | 69               | 66             | 65     | 69        | 69     | 72  | 77  | 77  | 73  | 70  | 66               | 55  | 53  |
| 2500                  | 75  | 76         | 73      | 71        | 79           | 73                     | 69               | 65             | 65     | 65        | 69     | 73  | 77  | 77  | 73  | 72  | 66               | 55  | 53  |
| 3150                  | 74  | 74         | 76      | 76        | 72           | 69                     | 67               | 62             | 63     | 67        | 71     | 77  | 76  | 71  | 69  | 69  | 48               | 48  | 48  |
| 4000                  | 77  | 78         | 76      | 77        | 76           | 72                     | 69               | 64             | 64     | 68        | 74     | 76  | 78  | 78  | 72  | 59  | 49               | 49  | 49  |
| 5000                  | 79  | 78         | 78      | 79        | 76           | 73                     | 70               | 63             | 61     | 65        | 72     | 76  | 78  | 75  | 71  | 58  | 47               | 39< | 38< |
| 6300                  | 76  | 75         | 74      | 77        | 75           | 73                     | 69               | 62             | 61     | 65        | 70     | 73  | 75  | 74  | 72  | 56  | 46               | 37< | 35< |
| 8000                  | 74  | 75         | 74      | 74        | 73           | 67                     | 62               | 60             | 64     | 70        | 74     | 75  | 75  | 73  | 70  | 58  | 46<              | 37< | 35< |
| 10000                 | 70  | 70         | 70      | 70        | 69           | 65                     | 63               | 58             | 59     | 64        | 69     | 70  | 71  | 70  | 67  | 54  | 42<              | 42< | 42< |
| OVERALL               | 90  | 88         | 89      | 90        | 88           | 89                     | 89               | 88             | 88     | 91        | 91     | 91  | 92  | 89  | 88  | 83  | 83               | 83  | 83  |

< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE I  
1/3 OCTAVE BAND  
DISTANCE = 75 METERS

| NOISE SOURCE/SUBJECT: |     | OPERATION:            |     | METEOROLOGY:                         |                           | IDENTIFICATIONS:              |     |
|-----------------------|-----|-----------------------|-----|--------------------------------------|---------------------------|-------------------------------|-----|
|                       |     | (5% RPM<br>FREE FLOW) |     | TEMP =<br>BAR PRESS =<br>REL HUMID = | 22 C<br>.760 M HG<br>84 % | RUN 02<br>06 MAY 75<br>PAGE 2 |     |
| FREQ<br>(HZ)          | 0   | 10                    | 20  | 30                                   | 40                        | 50                            | 60  |
|                       | 70< | 71<                   | 71< | 73<                                  | 73<                       | 75<                           | 75< |
| 25                    | 70< | 71<                   | 71< | 73<                                  | 73<                       | 75<                           | 75< |
| 31.5                  | 73< | 72<                   | 74< | 74<                                  | 75<                       | 75<                           | 75< |
| 40                    | 73< | 76                    | 75< | 76                                   | 77                        | 78                            | 79  |
| 50                    | 75  | 75                    | 75  | 77                                   | 77                        | 78                            | 79  |
| 63                    | 77< | 78                    | 77< | 76<                                  | 80                        | 80                            | 82  |
| 80                    | 78  | 78                    | 79  | 79                                   | 80                        | 82                            | 84  |
| 100                   | 81  | 80                    | 81  | 82                                   | 81                        | 83                            | 85  |
| 125                   | 82  | 83                    | 83  | 85                                   | 83                        | 85                            | 87  |
| 160                   | 83  | 82                    | 85  | 85                                   | 85                        | 86                            | 88  |
| 200                   | 83  | 83                    | 85  | 84                                   | 85                        | 85                            | 87  |
| 250                   | 81  | 82                    | 83  | 84                                   | 85                        | 85                            | 88  |
| 315                   | 82  | 84                    | 84  | 84                                   | 85                        | 85                            | 87  |
| 400                   | 84  | 87                    | 86  | 87                                   | 89                        | 87                            | 91  |
| 500                   | 81  | 85                    | 85  | 87                                   | 89                        | 88                            | 90  |
| 630                   | 77  | 81                    | 82  | 84                                   | 84                        | 87                            | 89  |
| 800                   | 78  | 81                    | 83  | 84                                   | 84                        | 87                            | 89  |
| 1000                  | 76  | 78                    | 81  | 82                                   | 83                        | 85                            | 87  |
| 1250                  | 75  | 78                    | 81  | 82                                   | 83                        | 84                            | 86  |
| 1600                  | 73  | 76                    | 79  | 81                                   | 83                        | 85                            | 89  |
| 2000                  | 77  | 78                    | 81  | 84                                   | 83                        | 84                            | 86  |
| 2500                  | 83  | 83                    | 83  | 84                                   | 84                        | 82                            | 82  |
| 3150                  | 64  | 63                    | 62  | 60                                   | 62                        | 64                            | 63  |
| 4000                  | 63  | 63                    | 61  | 77                                   | 79                        | 80                            | 82  |
| 5000                  | 63  | 63                    | 60  | 79                                   | 79                        | 78                            | 81  |
| 6300                  | 82  | 81                    | 76  | 79                                   | 77                        | 77                            | 81  |
| 8000                  | 78  | 78                    | 75  | 75                                   | 75                        | 75                            | 77  |
| 10000                 | 74  | 72                    | 69  | 70                                   | 71                        | 71                            | 73  |
| OVERALL               | 94  | 95                    | 96  | 96                                   | 97                        | 97                            | 99  |

< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: MEASURED SOUND PRESSURE LEVEL (DB)

5  
1/3 OCTAVE BAND  
DISTANCE = 75 METERS

| NOISE SOURCE/SUBJECT: |      | OPERATION:     |     |     |     |     |                  |     |     |     |     | METEOROLOGY:          |     |     |                 |     |     | IDENTIFICATION: |     |     |  |
|-----------------------|------|----------------|-----|-----|-----|-----|------------------|-----|-----|-----|-----|-----------------------|-----|-----|-----------------|-----|-----|-----------------|-----|-----|--|
|                       |      | MILITARY POWER |     |     |     |     | TEMP = 20 C      |     |     |     |     | BAR PRESS = .700 M HG |     |     | TEST 75-002-051 |     |     |                 |     |     |  |
|                       |      | 99.5% RPM      |     |     |     |     | REL HUMID = 65 % |     |     |     |     |                       |     |     | RUN 01          |     |     |                 |     |     |  |
|                       |      | FREE FLOW      |     |     |     |     |                  |     |     |     |     |                       |     |     | PAGE 2          |     |     |                 |     |     |  |
| FREQ                  | (HZ) | 0              | 10  | 20  | 30  | 40  | 50               | 60  | 70  | 80  | 90  | 100                   | 110 | 120 | 130             | 140 | 150 | 160             | 170 | 180 |  |
| 25                    | 80   | 79             | 80  | 81  | 82  | 84  | 83               | 84  | 85  | 84  | 86  | 85                    | 87  | 88  | 88              | 95  | 100 | 101             |     |     |  |
| 31.5                  | 81   | 82             | 82  | 82  | 83  | 84  | 83               | 85  | 85  | 86  | 90  | 90                    | 91  | 92  | 95              | 99  | 103 | 104             |     |     |  |
| 40                    | 83   | 83             | 84  | 84  | 84  | 85  | 85               | 85  | 86  | 87  | 90  | 90                    | 91  | 92  | 97              | 103 | 107 | 105             |     |     |  |
| 50                    | 84   | 85             | 86  | 86  | 86  | 86  | 86               | 87  | 88  | 89  | 92  | 93                    | 93  | 95  | 97              | 102 | 108 | 111             | 108 |     |  |
| 63                    | 86   | 86             | 87  | 87  | 88  | 88  | 88               | 89  | 90  | 91  | 91  | 93                    | 93  | 96  | 98              | 102 | 110 | 113             | 109 |     |  |
| 80                    | 87   | 88             | 88  | 88  | 89  | 89  | 89               | 90  | 91  | 91  | 93  | 95                    | 96  | 98  | 100             | 106 | 113 | 117             | 110 |     |  |
| 100                   | 89   | 89             | 90  | 90  | 92  | 91  | 92               | 93  | 94  | 94  | 97  | 99                    | 100 | 102 | 109             | 118 | 119 | 119             | 111 |     |  |
| 125                   | 92   | 91             | 92  | 92  | 93  | 92  | 93               | 95  | 95  | 95  | 99  | 101                   | 102 | 103 | 112             | 119 | 119 | 119             | 112 |     |  |
| 160                   | 94   | 92             | 96  | 94  | 95  | 95  | 95               | 96  | 97  | 97  | 101 | 104                   | 104 | 106 | 113             | 122 | 121 | 114             |     |     |  |
| 200                   | 92   | 94             | 95  | 96  | 95  | 96  | 97               | 97  | 97  | 99  | 103 | 104                   | 105 | 107 | 112             | 122 | 121 | 115             |     |     |  |
| 250                   | 92   | 95             | 96  | 97  | 96  | 97  | 96               | 97  | 98  | 99  | 103 | 103                   | 104 | 108 | 112             | 118 | 119 | 116             |     |     |  |
| 315                   | 96   | 100            | 100 | 101 | 99  | 99  | 98               | 98  | 99  | 100 | 102 | 104                   | 104 | 108 | 112             | 117 | 117 | 114             |     |     |  |
| 400                   | 104  | 109            | 109 | 107 | 107 | 107 | 105              | 105 | 105 | 102 | 99  | 101                   | 100 | 102 | 106             | 109 | 114 | 114             | 112 |     |  |
| 500                   | 103  | 108            | 109 | 109 | 109 | 109 | 106              | 103 | 100 | 98  | 101 | 101                   | 101 | 107 | 108             | 113 | 115 | 110             |     |     |  |
| 630                   | 100  | 105            | 108 | 109 | 108 | 108 | 106              | 103 | 100 | 99  | 99  | 99                    | 101 | 105 | 108             | 113 | 115 | 106             |     |     |  |
| 800                   | 96   | 101            | 104 | 106 | 106 | 106 | 106              | 104 | 103 | 101 | 101 | 101                   | 101 | 104 | 106             | 113 | 115 | 102             |     |     |  |
| 1000                  | 94   | 99             | 102 | 104 | 104 | 103 | 103              | 101 | 101 | 101 | 102 | 102                   | 102 | 104 | 110             | 112 | 114 | 100             |     |     |  |
| 1250                  | 91   | 96             | 100 | 102 | 103 | 102 | 101              | 101 | 101 | 101 | 103 | 103                   | 103 | 108 | 110             | 112 | 112 | 100             |     |     |  |
| 1600                  | 90   | 96             | 98  | 101 | 103 | 102 | 101              | 101 | 101 | 101 | 101 | 103                   | 103 | 104 | 106             | 110 | 112 | 99              |     |     |  |
| 2000                  | 88   | 93             | 96  | 99  | 100 | 100 | 100              | 100 | 100 | 100 | 100 | 101                   | 101 | 102 | 104             | 104 | 109 | 109             | 97  |     |  |
| 2500                  | 87   | 92             | 95  | 99  | 100 | 100 | 100              | 100 | 100 | 100 | 100 | 101                   | 101 | 103 | 106             | 105 | 108 | 109             | 96  |     |  |
| 3150                  | 87   | 91             | 94  | 97  | 99  | 99  | 99               | 99  | 99  | 99  | 100 | 100                   | 101 | 102 | 105             | 104 | 106 | 108             | 96  |     |  |
| 4000                  | 83   | 88             | 92  | 95  | 96  | 97  | 97               | 97  | 98  | 98  | 98  | 99                    | 101 | 102 | 105             | 106 | 103 | 105             | 93  |     |  |
| 5000                  | 82   | 87             | 91  | 94  | 95  | 96  | 96               | 96  | 96  | 97  | 99  | 100                   | 101 | 101 | 104             | 104 | 105 | 105             | 92  |     |  |
| 6300                  | 78   | 83             | 88  | 90  | 92  | 93  | 94               | 94  | 94  | 94  | 96  | 97                    | 98  | 98  | 101             | 103 | 103 | 103             | 89  |     |  |
| 8000                  | 75   | 80             | 85  | 88  | 89  | 90  | 90               | 91  | 92  | 93  | 94  | 95                    | 96  | 96  | 99              | 102 | 102 | 102             | 87  |     |  |
| 10000                 | 69   | 74             | 76  | 82  | 84  | 86  | 85               | 85  | 86  | 86  | 88  | 89                    | 91  | 92  | 96              | 99  | 99  | 99              | 84  |     |  |
| OVERALL               | 109  | 113            | 115 | 115 | 115 | 115 | 115              | 115 | 115 | 115 | 115 | 115                   | 115 | 115 | 115             | 116 | 122 | 129             | 123 |     |  |

LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE I DIRECTIVITY INDEX (DB)

6

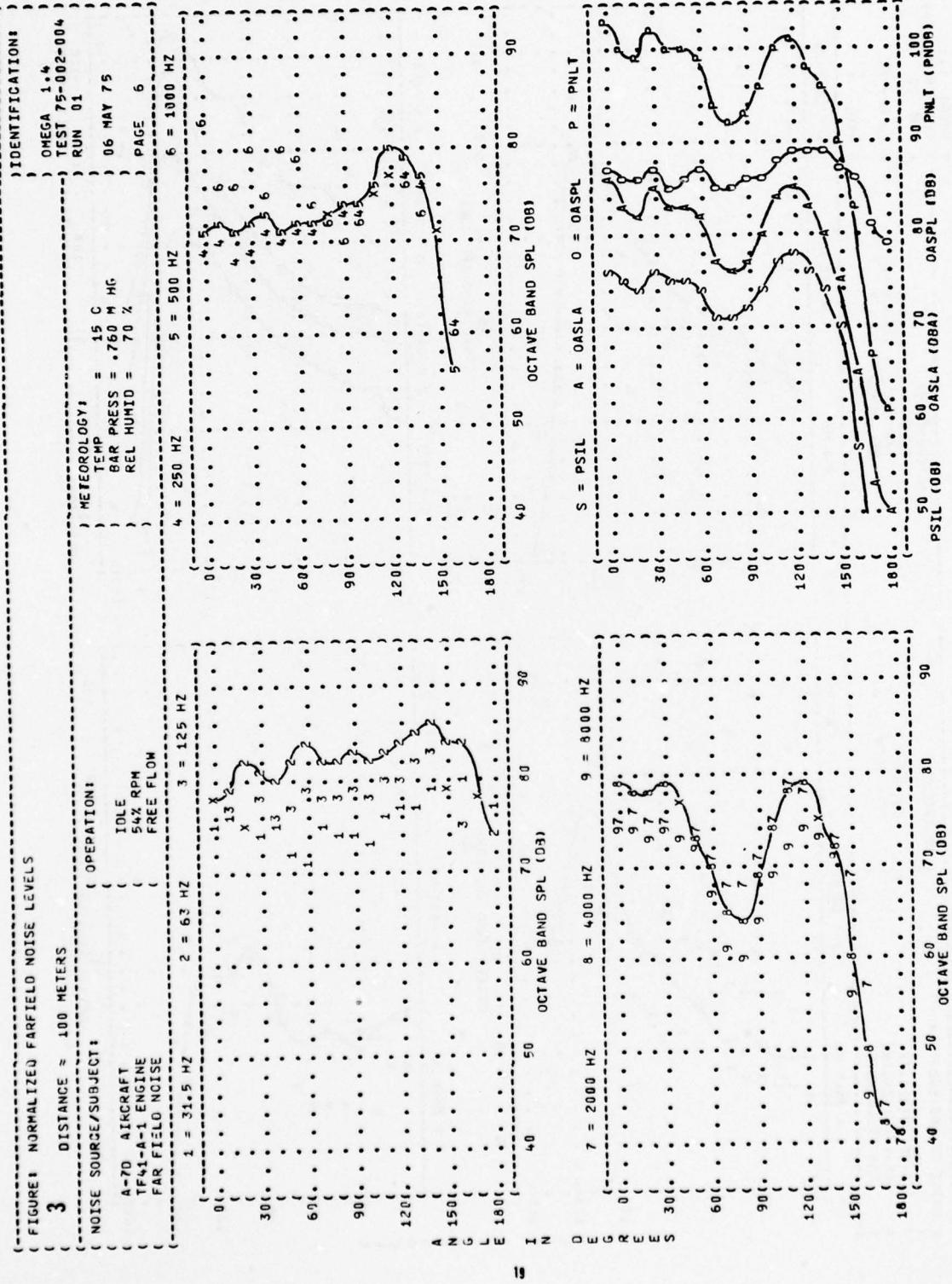
| NOISE SOURCE/SUBJECT: |          | OPERATION: |    |    |         |    |     |           |     |     |              | IDENTIFICATION: |     |                 |     |     |        |     |     |           |        |  |
|-----------------------|----------|------------|----|----|---------|----|-----|-----------|-----|-----|--------------|-----------------|-----|-----------------|-----|-----|--------|-----|-----|-----------|--------|--|
|                       |          | IDLE       |    |    | 54% RPM |    |     | FREE FLOW |     |     | METEOROLOGY: |                 |     | TEST 75-002-004 |     |     | RUN 01 |     |     | 06 MAY 75 |        |  |
|                       |          |            |    |    |         |    |     |           |     |     |              |                 |     |                 |     |     |        |     |     |           | PAGE 4 |  |
| NOISE                 | SOURCE   | FREQ (HZ)  | 0  | 10 | 20      | 30 | 40  | 50        | 60  | 70  | 80           | 90              | 100 | 110             | 120 | 130 | 140    | 150 | 160 | 170       | 180    |  |
| A-70                  | AIRCRAFT | 25         | 1  | 2  | 1       | -1 | -2  | -1        | -4  | -5  | -4           | -1              | -1  | -1              | -3  | 0   | 1      | 4   | 5   | 5         | 4      |  |
| TF41-A-1              | ENGINE   | 31.5       | -1 | -1 | -2      | -1 | -2  | -1        | -5  | -5  | 0            | -1              | -3  | -1              | -2  | 1   | 2      | 2   | 3   | 3         | 2      |  |
| FAR FIELD             | NOISE    | 40         | -1 | -1 | -1      | -1 | -1  | -1        | -7  | -7  | -1           | -1              | -3  | -1              | -1  | 0   | 1      | 2   | 3   | 2         | 0      |  |
|                       |          | 50         | -1 | -1 | -1      | -1 | -1  | -1        | -4  | -4  | -1           | -1              | -3  | -1              | -1  | 0   | 1      | 2   | 3   | 2         | -4     |  |
|                       |          | 63         | -6 | -6 | -1      | -1 | -1  | -1        | -4  | -1  | 2            | -3              | 0   | -2              | 0   | 1   | 1      | 1   | 1   | -5        | -10    |  |
|                       |          | 80         | -6 | -7 | -2      | -2 | -3  | 0         | -1  | -1  | -1           | -1              | -1  | -1              | -1  | 0   | 1      | 2   | 3   | 1         | -11    |  |
|                       |          | 100        | -6 | -6 | -1      | -1 | -1  | -1        | -1  | -1  | -1           | -1              | -1  | -1              | -1  | 0   | 0      | 1   | 2   | 3         | -14    |  |
|                       |          | 125        | -2 | -3 | -7      | -2 | -5  | -1        | -1  | -1  | -1           | -1              | -1  | -1              | -1  | 0   | 0      | 1   | 2   | 3         | 0      |  |
|                       |          | 160        | -1 | -3 | -7      | -1 | -1  | -1        | -4  | -1  | -1           | -1              | -1  | -1              | -1  | 0   | 0      | 1   | 2   | 3         | 0      |  |
|                       |          | 200        | -4 | -2 | -8      | -3 | -12 | -1        | -1  | -1  | -1           | -1              | -1  | -1              | -1  | 0   | 0      | 1   | 2   | 3         | -14    |  |
|                       |          | 250        | -6 | -5 | -4      | -4 | -4  | -5        | -5  | -5  | -5           | -5              | -5  | -5              | -5  | -5  | -5     | -5  | -5  | -5        | -9     |  |
|                       |          | 315        | -4 | -4 | -3      | -5 | -12 | -2        | -2  | -4  | -2           | -4              | -2  | -4              | -2  | -1  | 0      | 2   | 3   | 2         | -14    |  |
|                       |          | 400        | -4 | -2 | -2      | -3 | -11 | -3        | -4  | -4  | -3           | -4              | -3  | -1              | -1  | 0   | 2      | 3   | 2   | 3         | -17    |  |
|                       |          | 500        | -6 | -5 | -5      | -3 | -3  | -5        | -2  | -2  | -1           | -2              | -1  | -1              | -1  | 0   | 1      | 2   | 3   | 2         | -21    |  |
|                       |          | 630        | -2 | -1 | -2      | -1 | -12 | -3        | -4  | -5  | -4           | -5              | -4  | -2              | -1  | 1   | 1      | 2   | 3   | 1         | -19    |  |
|                       |          | 800        | -3 | -3 | -3      | -1 | -1  | -3        | -6  | -6  | -5           | -5              | -5  | -2              | -1  | 0   | 1      | 2   | 3   | 1         | -16    |  |
|                       |          | 1000       | -3 | -1 | -1      | -1 | -1  | -1        | -1  | -1  | -1           | -1              | -1  | -1              | -1  | 0   | 1      | 2   | 3   | 1         | -15    |  |
|                       |          | 1250       | 9  | 1  | 0       | 6  | 0   | 6         | 5   | -1  | -4           | -9              | -6  | -3              | -3  | -4  | 0      | 2   | 3   | 1         | -15    |  |
|                       |          | 1600       | -1 | -3 | -2      | -1 | -1  | -1        | -1  | -1  | -1           | -1              | -1  | -1              | -1  | 0   | 1      | 2   | 3   | 1         | -16    |  |
|                       |          | 2000       | -1 | -2 | -2      | -4 | -1  | -2        | -3  | -6  | -7           | -3              | -1  | -1              | -1  | 0   | 1      | 2   | 3   | 1         | -17    |  |
|                       |          | 2500       | 2  | 2  | 0       | -3 | 6   | 0         | -5  | -9  | -8           | -5              | -1  | -4              | -4  | 0   | 1      | 2   | 3   | 1         | -17    |  |
|                       |          | 3150       | 2  | 2  | 2       | 2  | 4   | 1         | -3  | -4  | -9           | -5              | -1  | 5               | 4   | 0   | 1      | 2   | 3   | 1         | -16    |  |
|                       |          | 4000       | 3  | 4  | 2       | 3  | 2   | -1        | -4  | -10 | -10          | -5              | -0  | 4               | 4   | 1   | 2      | 3   | 1   | -17       | -32    |  |
|                       |          | 5000       | 6  | 4  | 5       | 3  | 0   | -4        | -10 | -12 | -6           | -2              | 3   | 4               | 4   | 1   | 2      | 3   | 1   | -16       | -34    |  |
|                       |          | 6300       | 4  | 3  | 2       | 5  | 3   | -3        | -9  | -11 | -7           | -2              | 2   | 3               | 2   | 0   | 1      | 2   | 3   | 1         | -35    |  |
|                       |          | 8000       | 3  | 4  | 2       | 3  | 2   | 2         | -4  | -10 | -12          | -8              | -2  | 2               | 3   | 4   | 1      | 2   | 3   | 1         | -35    |  |
|                       |          | 10000      | 3  | 2  | 2       | 2  | 2   | 2         | -2  | -5  | -9           | -4              | -2  | 2               | 3   | 2   | 1      | 2   | 3   | 1         | -25    |  |
| OCTAVE                |          |            |    |    |         |    |     |           |     |     |              |                 |     |                 |     |     |        |     |     |           |        |  |
|                       |          | 31.5       | -0 | -1 | -1      | -2 | -3  | -1        | -1  | -1  | -1           | -1              | -1  | -1              | -1  | 0   | 1      | 2   | 3   | 1         | -9     |  |
|                       |          | 63         | -5 | -4 | -2      | -4 | -1  | -3        | -2  | -4  | -3           | -2              | -4  | -1              | -1  | 0   | 1      | 2   | 3   | 1         | -5     |  |
|                       |          | 125        | -1 | -2 | -4      | -1 | -3  | -2        | -4  | -3  | -2           | -3              | -2  | -1              | 0   | 1   | 1      | 2   | 3   | 0         | -4     |  |
|                       |          | 250        | -4 | -3 | -5      | -4 | -3  | -2        | -4  | -3  | -2           | -3              | -2  | -1              | 0   | 1   | 2      | 3   | 2   | -12       | -36    |  |
|                       |          | 500        | -4 | -3 | -3      | -1 | -0  | -5        | -1  | -4  | -2           | -1              | -6  | -1              | -1  | 0   | 1      | 2   | 3   | 2         | -16    |  |
|                       |          | 1000       | 7  | 1  | 0       | 5  | 1   | 5         | 4   | -2  | -1           | -6              | -1  | -3              | -1  | 1   | 0      | 1   | 2   | 3         | -17    |  |
|                       |          | 2000       | 1  | 1  | 0       | 1  | 0   | 1         | 3   | -1  | -4           | -7              | -7  | -3              | 0   | 5   | 4      | 0   | 1   | 2         | -16    |  |
|                       |          | 4000       | 4  | 4  | 3       | 4  | 2   | 1         | -4  | -10 | -10          | -6              | -1  | 4               | 4   | 1   | 2      | 3   | 1   | -16       | -35    |  |
|                       |          | 6000       | 3  | 3  | 2       | 4  | 3   | 1         | -4  | -9  | -11          | -7              | -1  | 2               | 3   | 0   | 1      | 2   | 3   | 0         | -34    |  |
| OVERALL               |          | 1          | -1 | -1 | 0       | -1 | -1  | 0         | -1  | -1  | 0            | -2              | -2  | -1              | -1  | 1   | 2      | 2   | 2   | 0         | -6     |  |

TABLE 6 DIRECTIVITY INDEX (08)

| NOISE SOURCE/SUBJECT: |     | OPERATION:           |     | METEOROLOGY:                         |                            | TEST 75-002-004     |        | IDENTIFICATION: |     |
|-----------------------|-----|----------------------|-----|--------------------------------------|----------------------------|---------------------|--------|-----------------|-----|
|                       |     | 85% RPM<br>FREE FLOW |     | TEMP =<br>BAR PRESS =<br>REL HUMID = | 22 C<br>.760 MM HG<br>84 % | RUN 02<br>06 MAY 75 | PAGE 4 |                 |     |
| NOISE SOURCE/SUBJECT: |     |                      |     |                                      |                            |                     |        |                 |     |
| A-70 AIRCRAFT         | 0   | 10                   | 20  | 30                                   | 40                         | 50                  | 60     | 70              | 80  |
| TF41-A-1 ENGINE       | -15 | -14                  | -12 | -10                                  | -8                         | -6                  | -5     | -4              | -3  |
| FAR FIELD NOISE       | -14 | -13                  | -12 | -10                                  | -8                         | -6                  | -5     | -4              | -3  |
| 1/3 OCTAVE            | -15 | -14                  | -12 | -10                                  | -8                         | -6                  | -5     | -4              | -3  |
| 25                    | -15 | -14                  | -12 | -10                                  | -8                         | -6                  | -5     | -4              | -3  |
| 31.5                  | -14 | -13                  | -12 | -10                                  | -8                         | -6                  | -5     | -4              | -3  |
| 40                    | -17 | -14                  | -12 | -10                                  | -8                         | -6                  | -5     | -4              | -3  |
| 50                    | -18 | -17                  | -16 | -14                                  | -12                        | -10                 | -8     | -7              | -6  |
| 63                    | -17 | -17                  | -16 | -14                                  | -12                        | -10                 | -8     | -7              | -6  |
| 80                    | -16 | -18                  | -17 | -16                                  | -15                        | -12                 | -11    | -9              | -8  |
| 100                   | -19 | -20                  | -19 | -18                                  | -17                        | -15                 | -13    | -12             | -10 |
| 125                   | -21 | -21                  | -20 | -19                                  | -19                        | -17                 | -14    | -13             | -11 |
| 160                   | -22 | -22                  | -19 | -20                                  | -19                        | -18                 | -16    | -14             | -13 |
| 200                   | -20 | -20                  | -18 | -19                                  | -18                        | -17                 | -14    | -13             | -11 |
| 250                   | -20 | -19                  | -18 | -18                                  | -17                        | -16                 | -16    | -15             | -14 |
| 315                   | -19 | -17                  | -17 | -16                                  | -16                        | -15                 | -14    | -13             | -12 |
| 400                   | -18 | -14                  | -15 | -14                                  | -13                        | -14                 | -11    | -9              | -7  |
| 500                   | -16 | -14                  | -14 | -12                                  | -10                        | -11                 | -9     | -8              | -7  |
| 630                   | -19 | -16                  | -16 | -14                                  | -13                        | -13                 | -10    | -9              | -8  |
| 800                   | -19 | -15                  | -13 | -12                                  | -12                        | -12                 | -9     | -7              | -6  |
| 1000                  | -17 | -15                  | -12 | -12                                  | -11                        | -10                 | -9     | -7              | -6  |
| 1250                  | -16 | -12                  | -9  | -8                                   | -7                         | -7                  | -5     | -4              | -3  |
| 1600                  | -17 | -14                  | -11 | -11                                  | -10                        | -7                  | -6     | -5              | -4  |
| 2000                  | -11 | -10                  | -9  | -8                                   | -7                         | -5                  | -5     | -4              | -3  |
| 2500                  | -4  | -4                   | -6  | -4                                   | -3                         | -5                  | -5     | -4              | -3  |
| 3150                  | -1  | -2                   | -3  | -5                                   | -4                         | -4                  | -3     | -2              | -1  |
| 4000                  | -3  | -4                   | -5  | -9                                   | -7                         | -6                  | -4     | -3              | -2  |
| 5000                  | -1  | -1                   | -4  | -5                                   | -6                         | -4                  | -3     | -2              | -1  |
| 6300                  | -1  | -2                   | -7  | -4                                   | -5                         | -6                  | -4     | -2              | -1  |
| 8000                  | -5  | -5                   | -7  | -8                                   | -6                         | -7                  | -5     | -2              | -1  |
| 10000                 | -5  | -6                   | -9  | -9                                   | -7                         | -8                  | -7     | -2              | -1  |
| OCTAVE                |     |                      |     |                                      |                            |                     |        |                 |     |
| 31.5                  | -15 | -14                  | -13 | -12                                  | -12                        | -9                  | -8     | -6              | -4  |
| 63                    | -18 | -17                  | -17 | -16                                  | -16                        | -14                 | -12    | -10             | -8  |
| 125                   | -21 | -21                  | -20 | -19                                  | -18                        | -16                 | -14    | -13             | -12 |
| 250                   | -20 | -19                  | -19 | -18                                  | -17                        | -15                 | -13    | -12             | -10 |
| 500                   | -18 | -19                  | -15 | -13                                  | -12                        | -10                 | -9     | -7              | -6  |
| 1000                  | -17 | -15                  | -12 | -11                                  | -10                        | -9                  | -7     | -5              | -4  |
| 2000                  | -9  | -8                   | -7  | -5                                   | -5                         | -5                  | -4     | -1              | -1  |
| 4000                  | -2  | -3                   | -4  | -6                                   | -5                         | -4                  | -3     | -2              | -1  |
| 8000                  | -3  | -3                   | -7  | -6                                   | -7                         | -6                  | -4     | -2              | -1  |
| OVERALL               | -17 | -16                  | -16 | -15                                  | -15                        | -13                 | -11    | -10             | -8  |

TABLE : DIRECTIVITY INDEX (DB)  
6

| NOISE SOURCE/SUBJECT: |     | OPERATIONS     |     |     |                      |     |     |             |     |     | METEOROLOGY      |     |     |                 |     |     |           |     |     | IDENTIFICATION |  |
|-----------------------|-----|----------------|-----|-----|----------------------|-----|-----|-------------|-----|-----|------------------|-----|-----|-----------------|-----|-----|-----------|-----|-----|----------------|--|
|                       |     | MILITARY POWER |     |     | BAR PRESS = 700 M HG |     |     | TEMP = 20 C |     |     | REL HUMID = 65 % |     |     | TEST 75-002-051 |     |     | OMEGA 1.4 |     |     |                |  |
|                       |     | 99.5% RPM      |     |     | FREE FLOW            |     |     |             |     |     |                  |     |     |                 |     |     | RUN 01    |     |     |                |  |
| FREQ<br>(HZ)          |     | 0              | 10  | 20  | 30                   | 40  | 50  | 60          | 70  | 80  | 90               | 100 | 110 | 120             | 130 | 140 | 150       | 160 | 170 | 180            |  |
| 1/3 OCTAVE            |     |                |     |     |                      |     |     |             |     |     |                  |     |     |                 |     |     |           |     |     |                |  |
| 25                    | -12 | -13            | -12 | -11 | -10                  | -13 | -8  | -7          | -8  | -6  | -7               | -5  | -1  | 3               | 8   | 9   |           |     |     |                |  |
| 31.5                  | -14 | -13            | -13 | -12 | -12                  | -11 | -9  | -9          | -8  | -7  | -7               | -5  | -1  | 4               | 6   | 9   |           |     |     |                |  |
| 40                    | -15 | -15            | -14 | -15 | -13                  | -13 | -12 | -8          | -8  | -7  | -6               | -5  | -1  | 5               | 9   | 7   |           |     |     |                |  |
| 50                    | -19 | -18            | -17 | -16 | -16                  | -15 | -14 | -13         | -10 | -10 | -7               | -5  | -1  | 6               | 9   | 6   |           |     |     |                |  |
| 63                    | -18 | -18            | -17 | -16 | -15                  | -14 | -13 | -12         | -11 | -10 | -8               | -5  | -2  | 6               | 9   | 5   |           |     |     |                |  |
| 80                    | -20 | -19            | -19 | -18 | -17                  | -16 | -14 | -12         | -11 | -9  | -7               | -1  | 6   | 10              | 3   |     |           |     |     |                |  |
| 100                   | -21 | -21            | -20 | -18 | -17                  | -16 | -15 | -14         | -13 | -11 | -10              | -8  | -1  | 6               | 9   | 1   |           |     |     |                |  |
| 125                   | -19 | -20            | -19 | -18 | -18                  | -17 | -16 | -16         | -15 | -14 | -10              | -9  | -8  | 1               | 8   | 8   | 2         |     |     |                |  |
| 160                   | -20 | -22            | -17 | -20 | -19                  | -18 | -17 | -16         | -15 | -12 | -10              | -7  | -0  | 9               | 8   | 1   |           |     |     |                |  |
| 200                   | -21 | -19            | -18 | -17 | -18                  | -16 | -16 | -15         | -14 | -10 | -9               | -6  | -1  | 9               | 8   | 2   |           |     |     |                |  |
| 250                   | -19 | -16            | -15 | -14 | -15                  | -14 | -13 | -12         | -8  | -7  | -3               | 1   | 7   | 8               | 5   |     |           |     |     |                |  |
| 315                   | -13 | -9             | -9  | -9  | -10                  | -11 | -12 | -11         | -9  | -8  | -5               | -1  | 3   | 8               | 5   | 5   |           |     |     |                |  |
| 400                   | -4  | 1              | 1   | -1  | -1                   | -1  | -3  | -6          | -9  | -7  | -6               | -2  | 1   | 6               | 6   | 4   |           |     |     |                |  |
| 500                   | -5  | -5             | 0   | 1   | 1                    | 1   | -2  | -5          | -8  | -10 | -7               | -1  | 0   | 5               | 7   | 2   |           |     |     |                |  |
| 630                   | -8  | -3             | 0   | 1   | 1                    | 0   | -2  | -5          | -8  | -7  | -3               | 0   | 5   | 7               | 2   |     |           |     |     |                |  |
| 800                   | -11 | -6             | -4  | -1  | -2                   | -2  | -3  | -5          | -6  | -8  | -6               | -3  | 1   | 6               | 8   | -5  |           |     |     |                |  |
| 1000                  | -13 | -7             | -4  | -3  | -3                   | -3  | -5  | -6          | -5  | -5  | -5               | -3  | 3   | 6               | 8   | -7  |           |     |     |                |  |
| 1250                  | -14 | -9             | -5  | -3  | -2                   | -3  | -4  | -5          | -4  | -4  | -2               | -3  | 3   | 5               | 7   | -5  |           |     |     |                |  |
| 1600                  | -15 | -9             | -7  | -4  | -2                   | -3  | -4  | -4          | -4  | -4  | -2               | -1  | 1   | 5               | 7   | -6  |           |     |     |                |  |
| 2000                  | -15 | -10            | -7  | -4  | -3                   | -3  | -3  | -3          | -3  | -2  | -1               | 1   | 1   | 6               | 6   | -6  |           |     |     |                |  |
| 2500                  | -16 | -11            | -8  | -4  | -3                   | -3  | -3  | -3          | -3  | -2  | -0               | 3   | 2   | 5               | 6   | -7  |           |     |     |                |  |
| 3150                  | -16 | -12            | -8  | -5  | -3                   | -3  | -3  | -3          | -2  | -1  | -0               | 3   | 2   | 4               | 6   | -6  |           |     |     |                |  |
| 4000                  | -17 | -12            | -9  | -5  | -4                   | -3  | -3  | -3          | -2  | -1  | -1               | 1   | 1   | 4               | 6   | -7  |           |     |     |                |  |
| 5000                  | -18 | -13            | -9  | -6  | -4                   | -3  | -3  | -3          | -2  | -0  | 0                | 2   | 1   | 5               | 6   | -7  |           |     |     |                |  |
| 6300                  | -19 | -14            | -9  | -7  | -5                   | -4  | -3  | -3          | -2  | -1  | 0                | 1   | 1   | 4               | 6   | -6  |           |     |     |                |  |
| 8000                  | -19 | -14            | -10 | -7  | -6                   | -4  | -4  | -4          | -2  | -1  | -0               | 1   | 2   | 4               | 7   | -8  |           |     |     |                |  |
| 10000                 | -22 | -17            | -12 | -9  | -7                   | -5  | -6  | -5          | -3  | -2  | 0                | 1   | 6   | 8               | -7  |     |           |     |     |                |  |
| OCTAVE                |     |                |     |     |                      |     |     |             |     |     |                  |     |     |                 |     |     |           |     |     |                |  |
| 31.5                  | -14 | -14            | -14 | -14 | -12                  | -13 | -11 | -10         | -8  | -8  | -7               | -6  | -1  | 5               | 8   | 8   |           |     |     |                |  |
| 63                    | -19 | -18            | -16 | -17 | -16                  | -15 | -13 | -11         | -10 | -8  | -6               | -5  | -1  | 6               | 9   | 4   |           |     |     |                |  |
| 125                   | -20 | -21            | -18 | -19 | -18                  | -18 | -17 | -16         | -12 | -10 | -9               | -8  | -7  | 0               | 8   | 8   | 1         |     |     |                |  |
| 250                   | -18 | -14            | -14 | -13 | -14                  | -14 | -14 | -14         | -13 | -13 | -9               | -8  | -7  | -4              | 1   | 8   | 7         | 4   |     |                |  |
| 500                   | -5  | 0              | 1   | 0   | 0                    | 0   | -1  | -4          | -7  | -8  | -5               | -5  | -3  | 2               | 6   | 7   | 2         |     |     |                |  |
| 1000                  | -12 | -7             | -4  | -2  | -2                   | -2  | -2  | -4          | -4  | -4  | -5               | -5  | -2  | -1              | 1   | 6   | 6         | -6  |     |                |  |
| 2000                  | -15 | -10            | -7  | -4  | -3                   | -3  | -3  | -3          | -3  | -2  | -1               | -1  | 1   | 1               | 5   | 6   | -6        |     |     |                |  |
| 4000                  | -17 | -12            | -9  | -5  | -4                   | -4  | -4  | -5          | -5  | -5  | -3               | -2  | -1  | 0               | 2   | 4   | 6         | -7  |     |                |  |
| 8000                  | -19 | -14            | -9  | -7  | -5                   | -4  | -4  | -4          | -3  | -3  | -1               | -0  | 1   | 2               | 5   | 7   | -7        |     |     |                |  |
| OVERALL               | -12 | -8             | -6  | -6  | -6                   | -7  | -8  | -9          | -8  | -7  | -6               | -4  | -4  | 1               | 7   | 8   | 2         |     |     |                |  |



{ FIGURE 3 NORMALIZED FARFIELD NOISE LEVELS

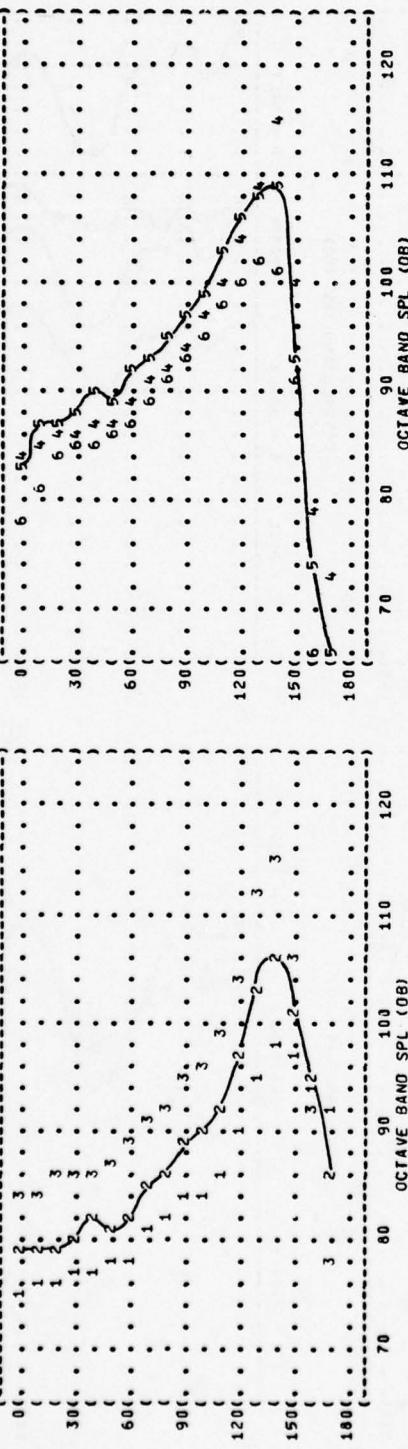
{ 3 DISTANCE = 100 METERS

{ NOISE SOURCE/SUBJECT:

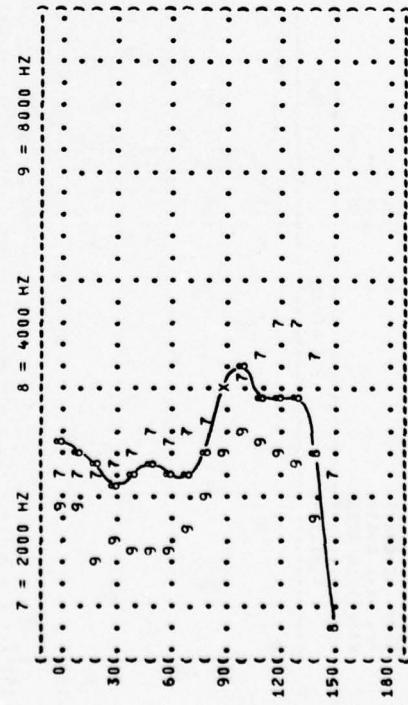
{ A-70 AIRCRAFT  
{ TF41-A-1 ENGINE  
{ FAR FIELD NOISE

{ OPERATION:  
{ 85% RPM  
{ FREE FLOW

{ 1 = 31.5 Hz 2 = 63 Hz 3 = 125 Hz

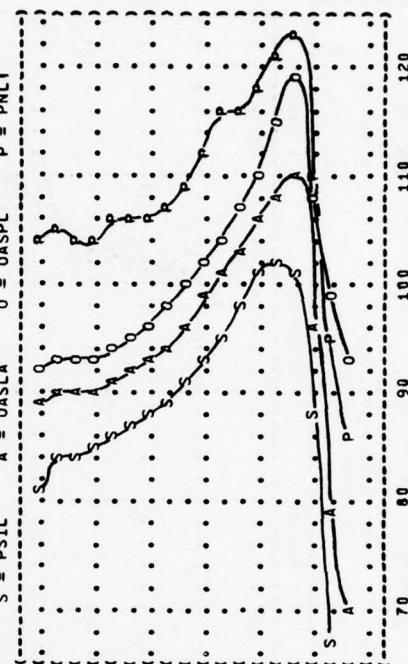


{ 7 = 2000 Hz 8 = 4000 Hz 9 = 8000 Hz



{ METEOROLOGY:  
{ TEMP = 15°C  
{ BAR PRESS = 760 MM HG  
{ REL HUMID = 70%

{ 4 = 250 Hz 5 = 500 Hz 6 = 1000 Hz



{ IDENTIFICATION:  
{ OMEGA 1.4  
{ TEST 75-002-004  
{ RUN 02  
{ 06 MAY 75  
{ PAGE 6

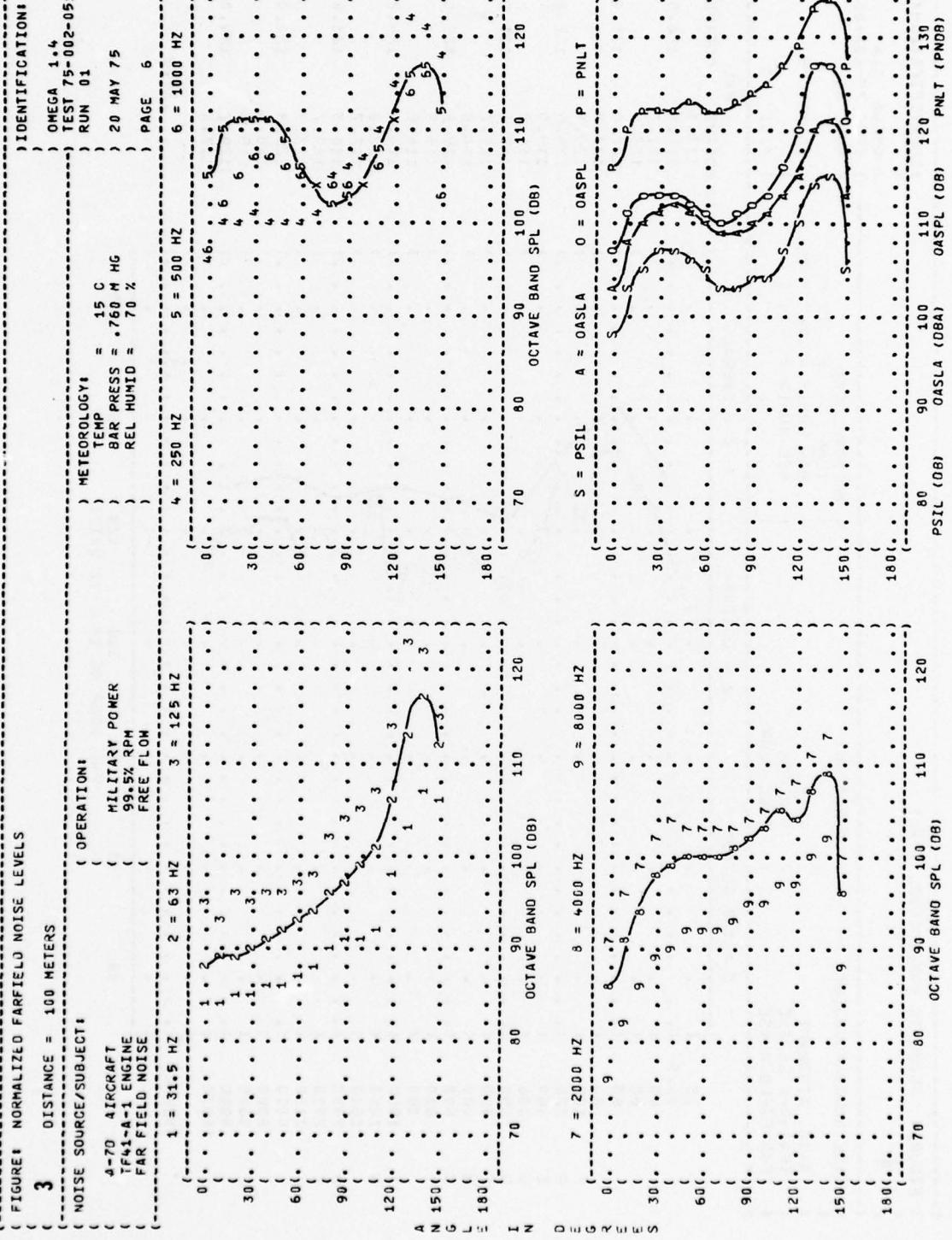
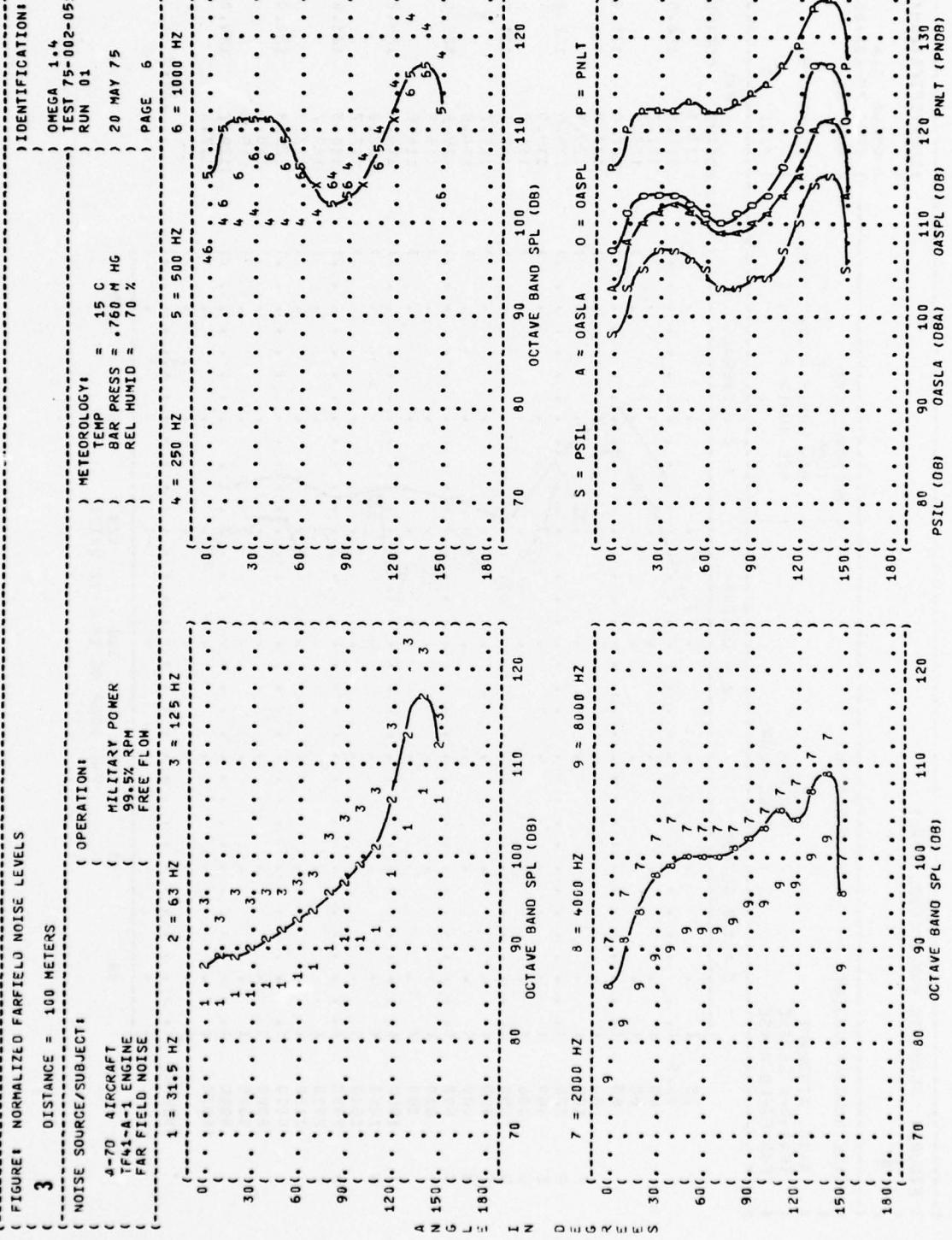
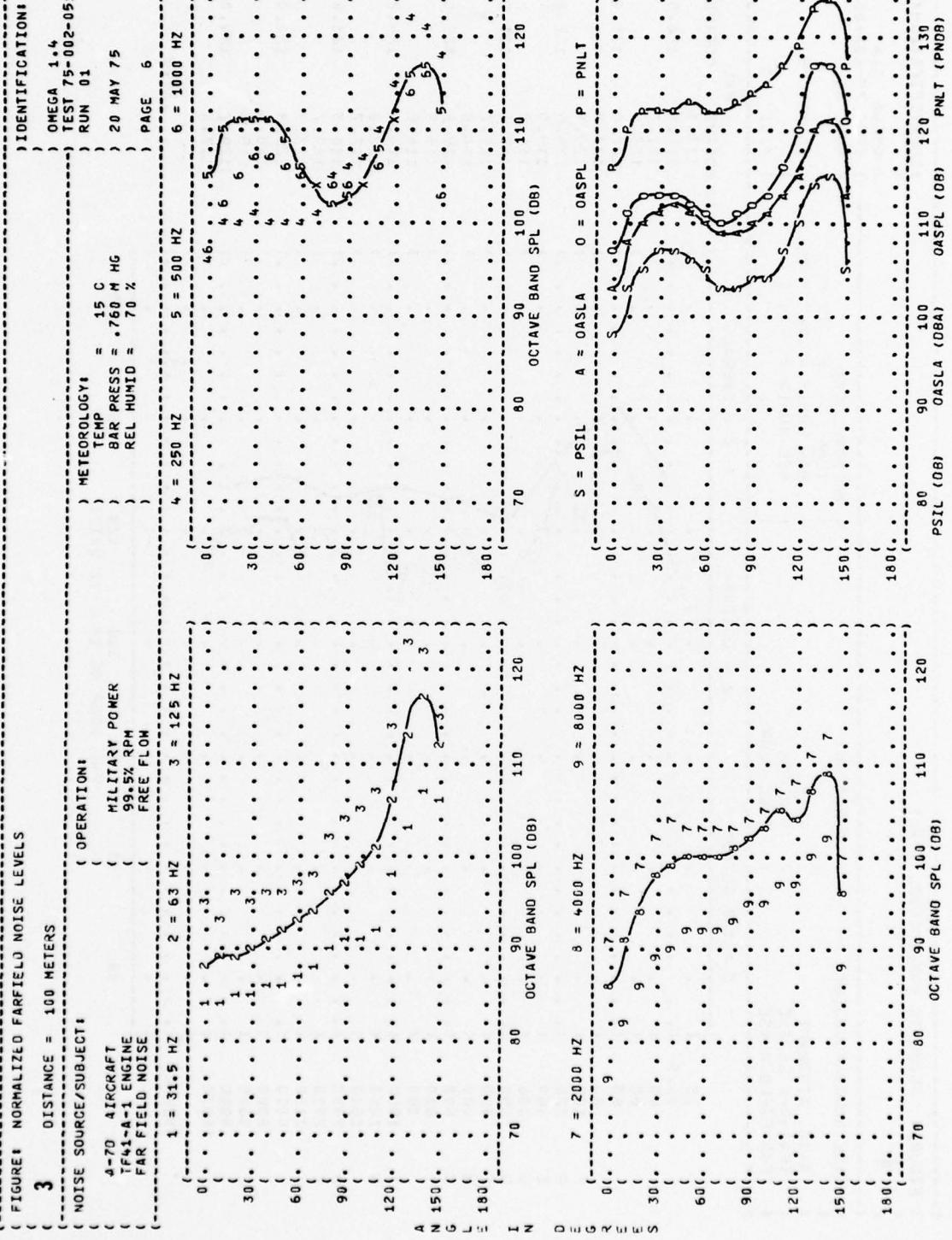
FIGURE: NORMALIZED FARFIELD NOISE LEVELS

3 DISTANCE = 100 METERS

NOISE SOURCE/SUBJECT: OPERATION:

4-70 AIRCRAFT  
TF41-A-1 ENGINE  
FAR FIELD NOISE  
MILITARY POWER  
99.5% RPM  
FREE FLOW

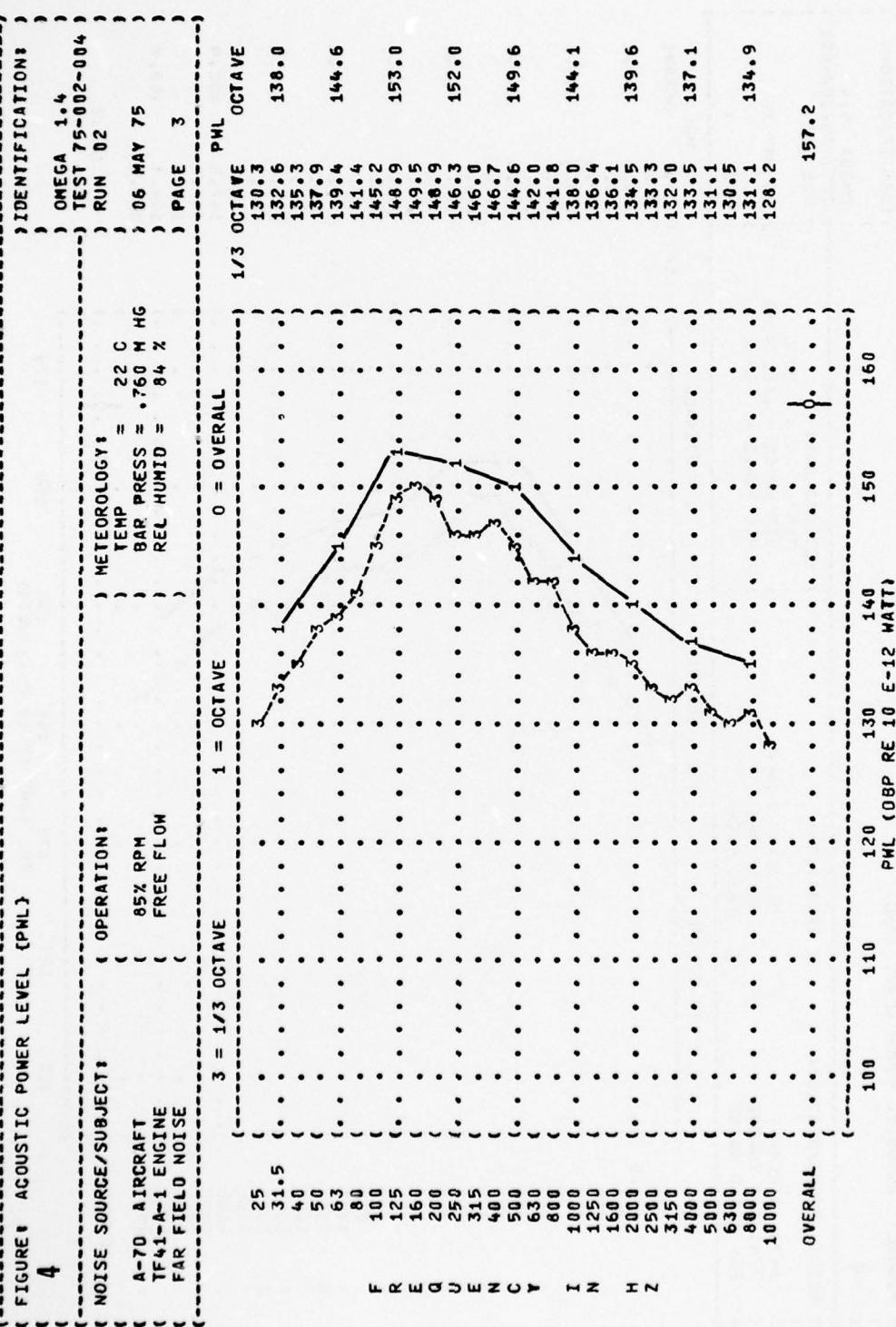
1 = 31.5 Hz  
2 = 63 Hz  
3 = 125 Hz  
4 = 250 Hz  
5 = 500 Hz  
6 = 1000 Hz





{ FIGURE 4 ACOUSTIC POWER LEVEL (PWL)

4



{ FIGURE: ACOUSTIC POWER LEVEL (PWL)

4

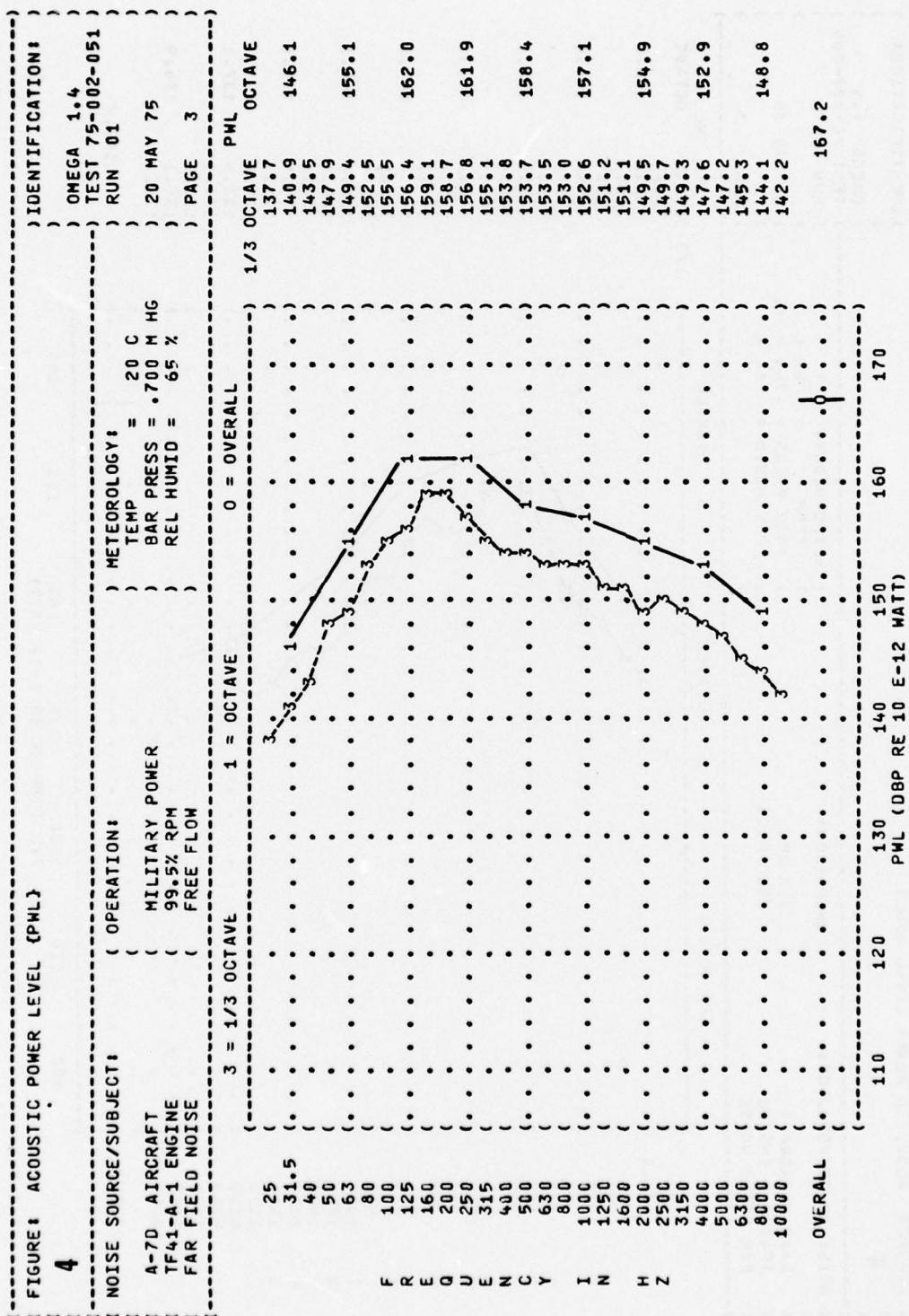


FIGURE: OVERALL SOUND PRESSURE LEVEL (OASPL)  
**5**  
 EQUAL LEVEL CONTOURS (DB)

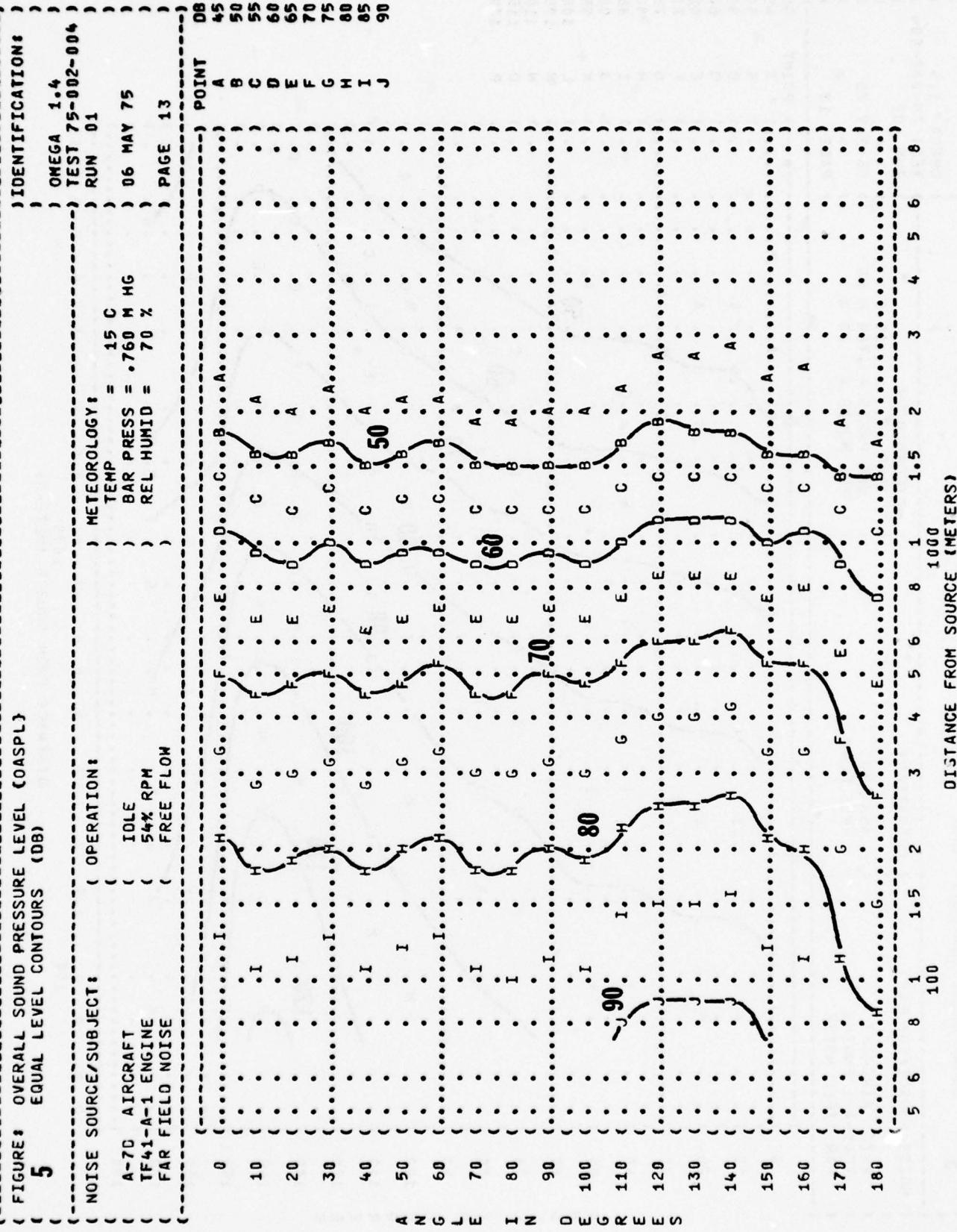
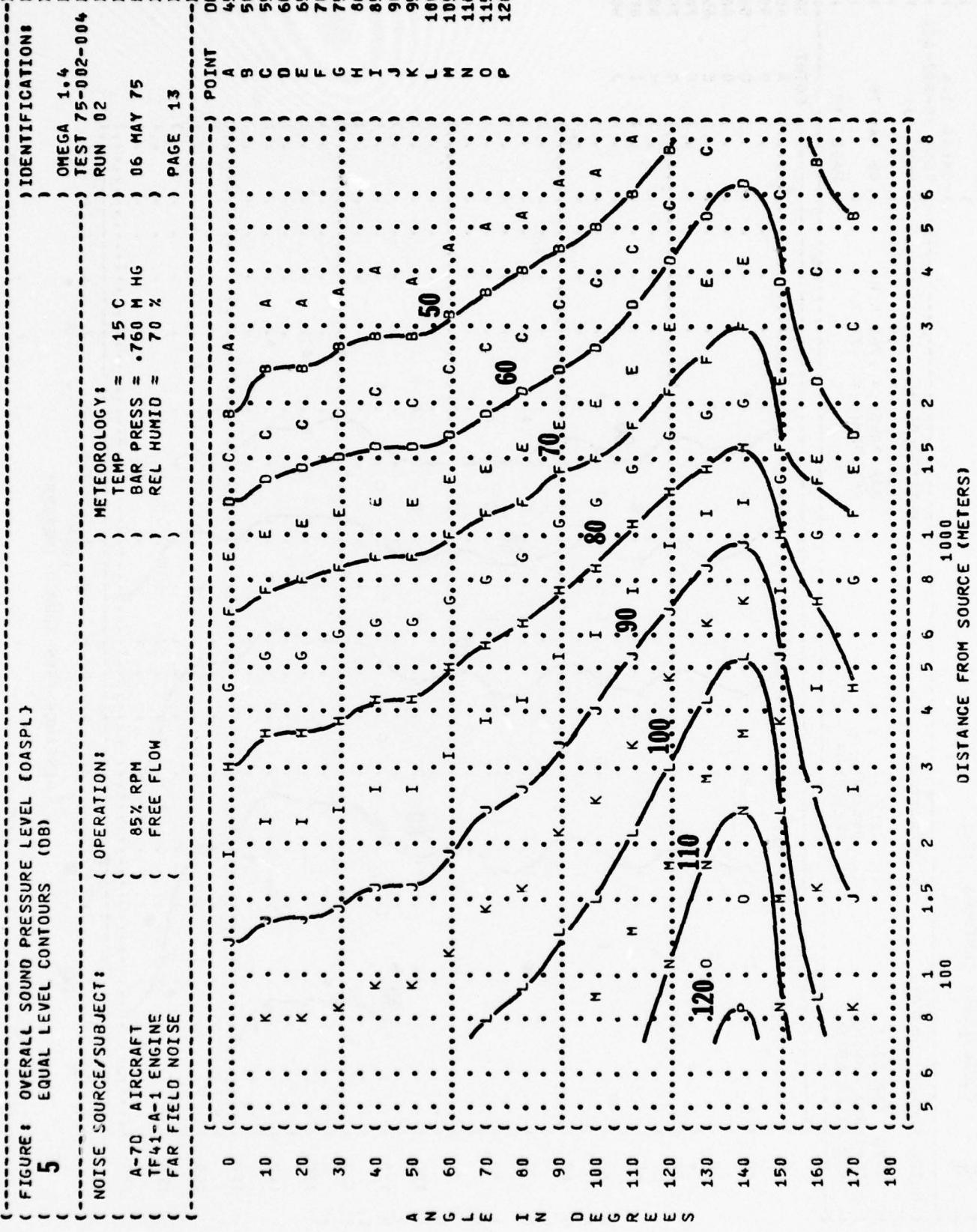


FIGURE : OVERALL SOUND PRESSURE LEVEL (OB)  
**5** EQUAL LEVEL CONTOURS (OB)



( FIGURE: OVERALL SOUND PRESSURE LEVEL (OASPL)  
 5 EQUAL LEVEL CONTOURS (DB)

NOISE SOURCE/SUBJECT: A-7D AIRCRAFT  
 TF41-A-1 ENGINE  
 FAR FIELD NOISE

OPERATION:  
 MILITARY POWER  
 99.5% RPM  
 FREE FLOW

) IDENTIFICATION:

) OMEGA 1<sup>0.4</sup>  
 TEST 75-002-051  
 RUN 01

) METEOROLOGY:  
 TEMP = 15 C  
 BAR PRESS = .760 M HG  
 REL HUMID = 70 %

) PAGE 13

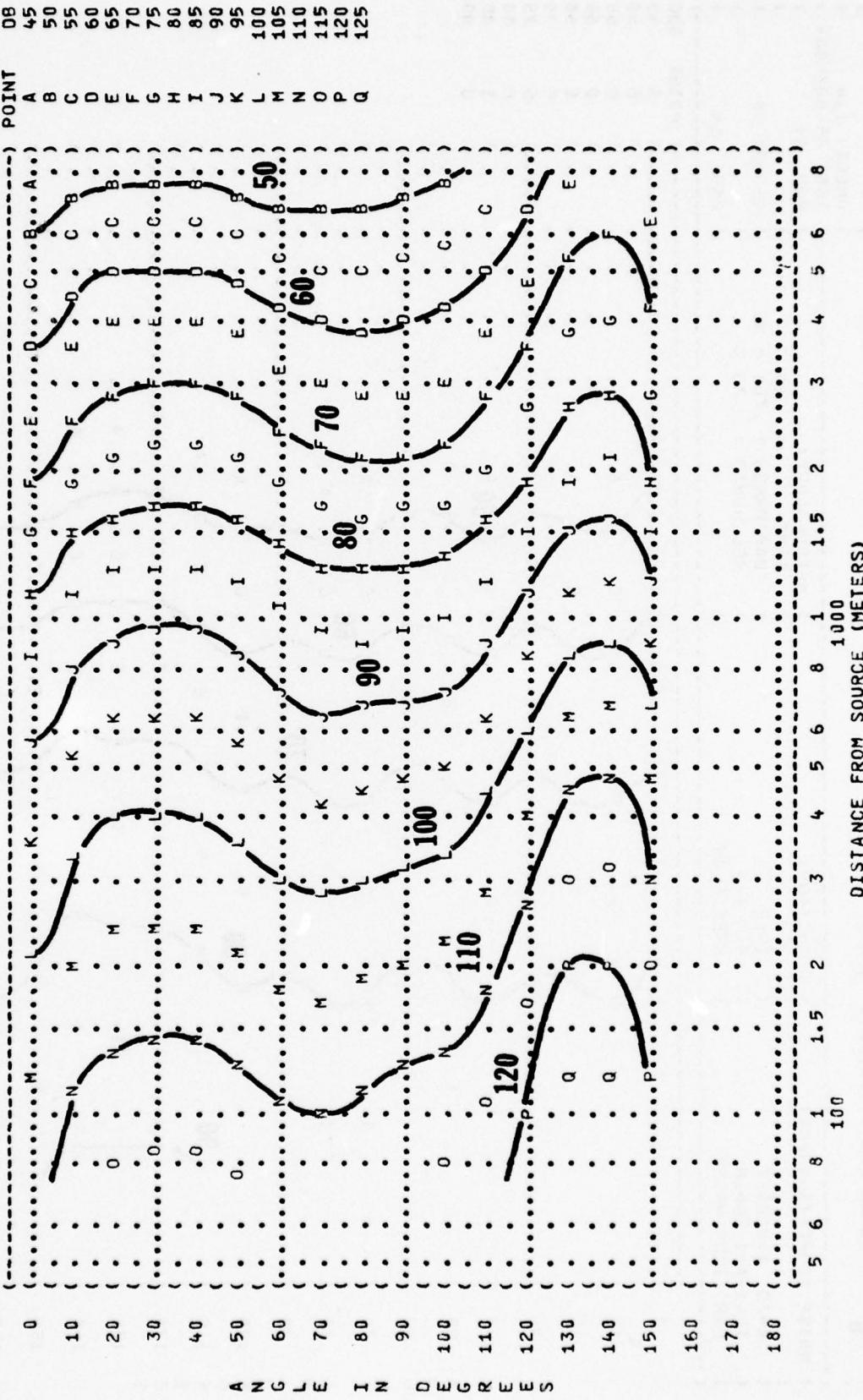


FIGURE: C-WEIGHTED OVERALL SOUND LEVEL (DBC)  
**6** EQUAL LEVEL CONTOURS (DBC)

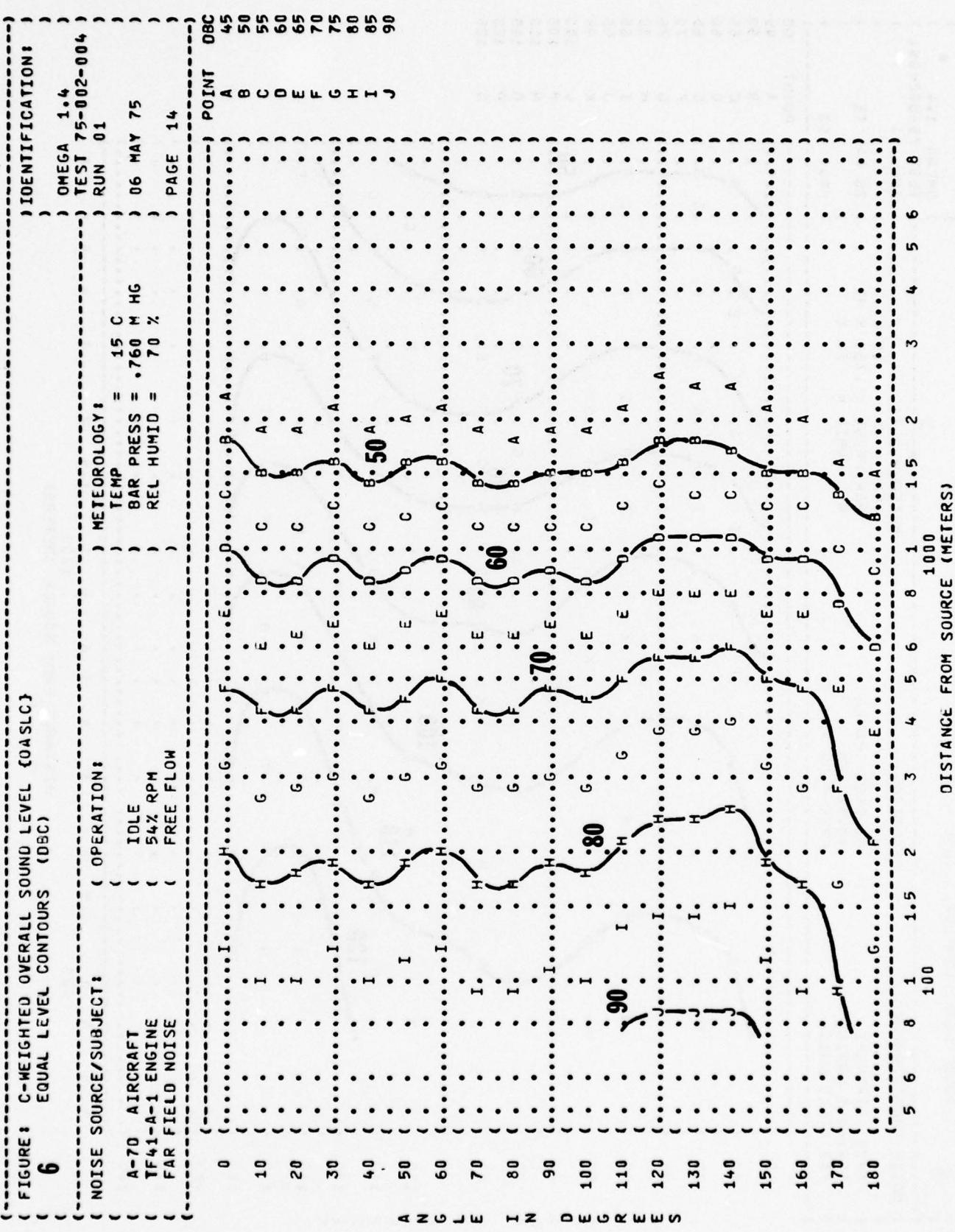


FIGURE: C-WEIGHTED OVERALL SOUND LEVEL (DBC)  
**6**  
EQUAL LEVEL CONTOURS (DBC)

NOISE SOURCE/SUBJECT:  
A-70 AIRCRAFT  
TF41-A-1 ENGINE  
FAR FIELD NOISE

OPERATION:  
85% RPM  
FREE FLOW

METEOROLOGY:  
TEMP = 15 C  
BAR PRESS = .760 M HG  
REL HUMID = 70 %

IDENTIFICATION:  
OMEGA 1.4  
TEST 75-002-004  
RUN 02  
06 MAY 75  
PAGE 14

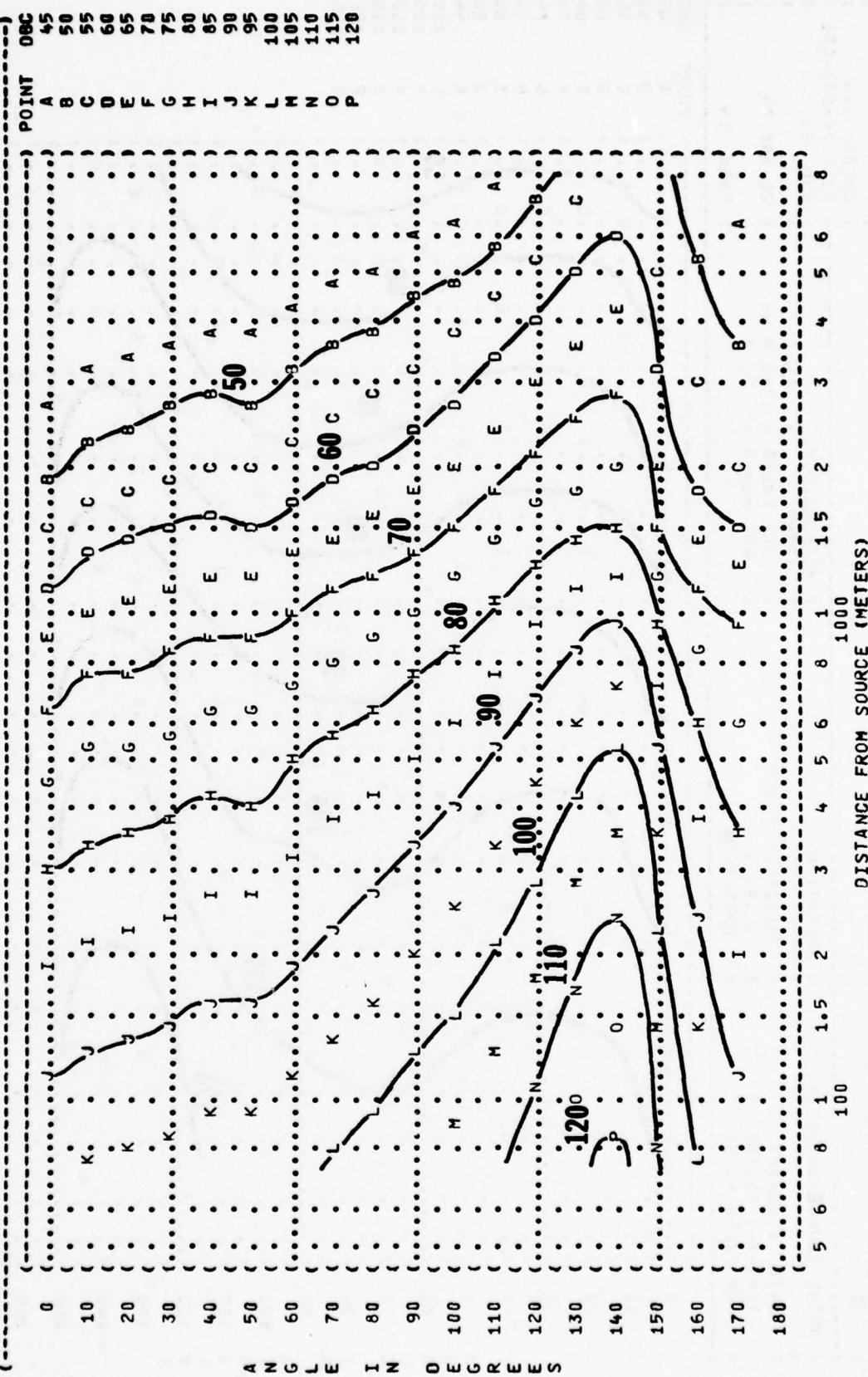


FIGURE 6 C-WEIGHTED OVERALL SOUND LEVEL (OASLC) EQUAL LEVEL CONTOURS (DBC)

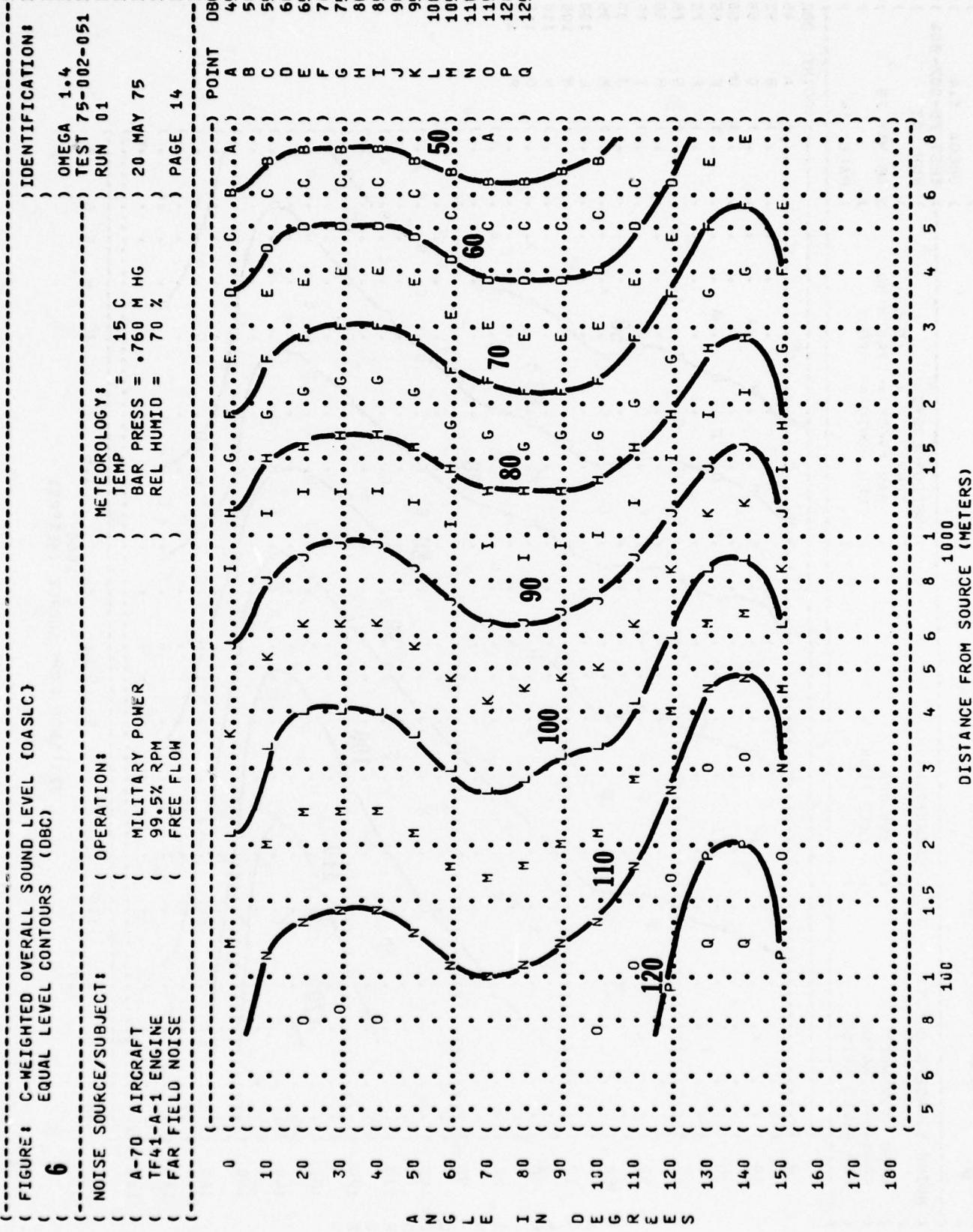


FIGURE: A-WEIGHTED OVERALL SOUND LEVEL (DBA)  
7 EQUAL LEVEL CONTOURS (DBA)

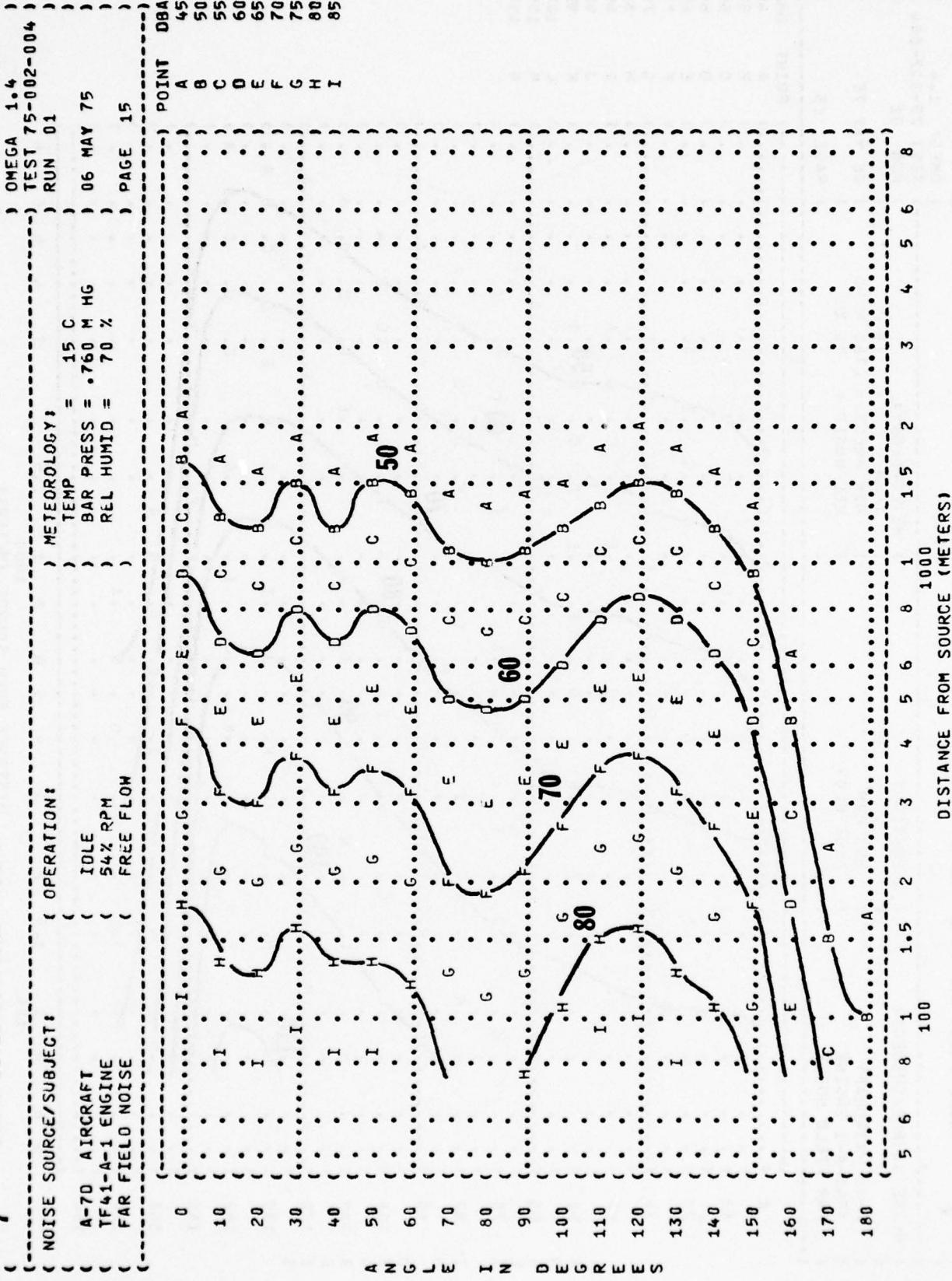


FIGURE: A-WEIGHTED OVERALL SOUND LEVEL (OASLA)  
7 EQUAL LEVEL CONTOURS

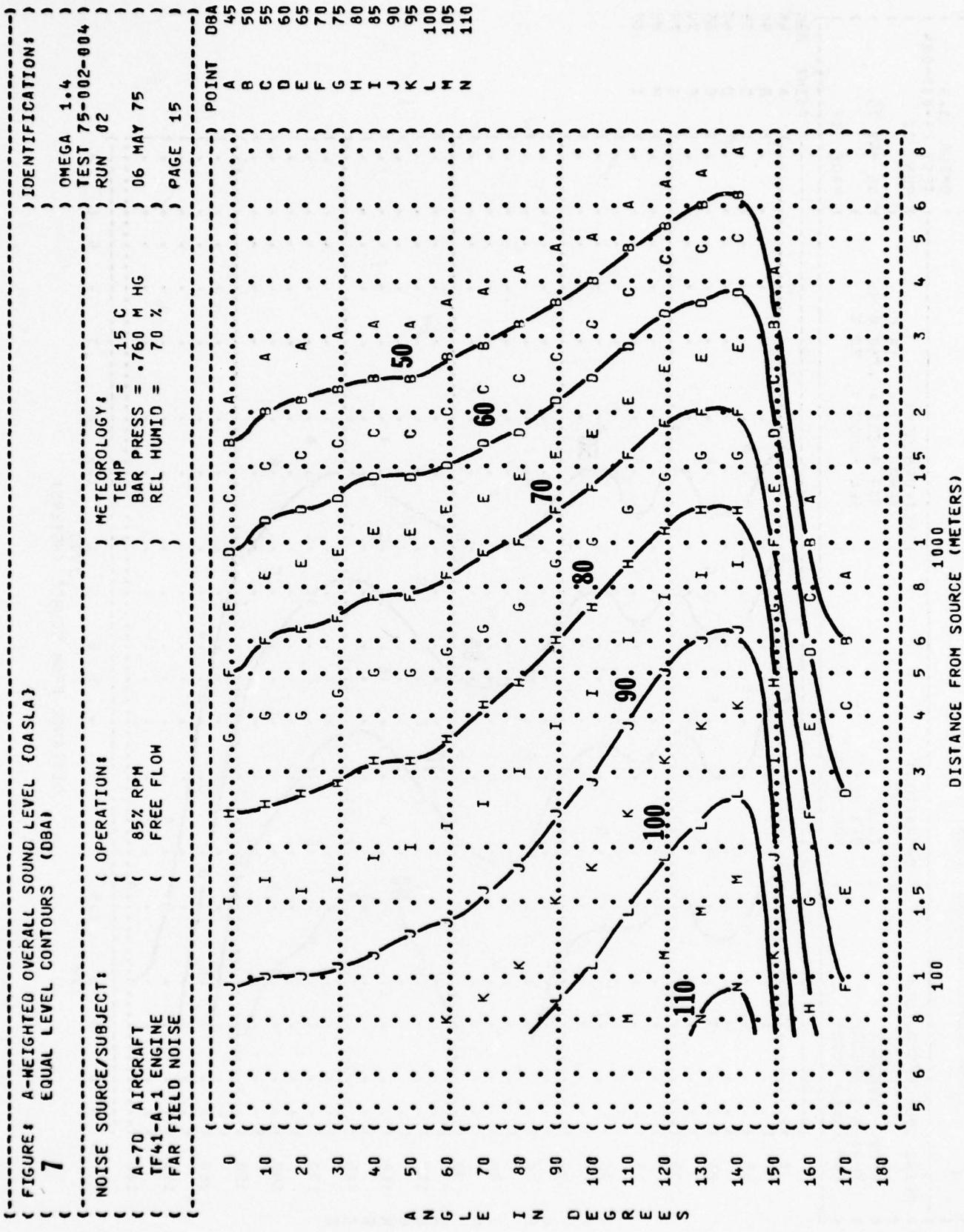


FIGURE: A-WEIGHTED OVERALL SOUND LEVEL (DBA)  
EQUAL LEVEL CONTOURS (DBA)

7

NOISE SOURCE/SUBJECT: OPERATION:

A-7D AIRCRAFT  
TF41-A-1 ENGINE  
FAR FIELD NOISE  
MILITARY POWER  
99.5% RPM  
FREE FLOW

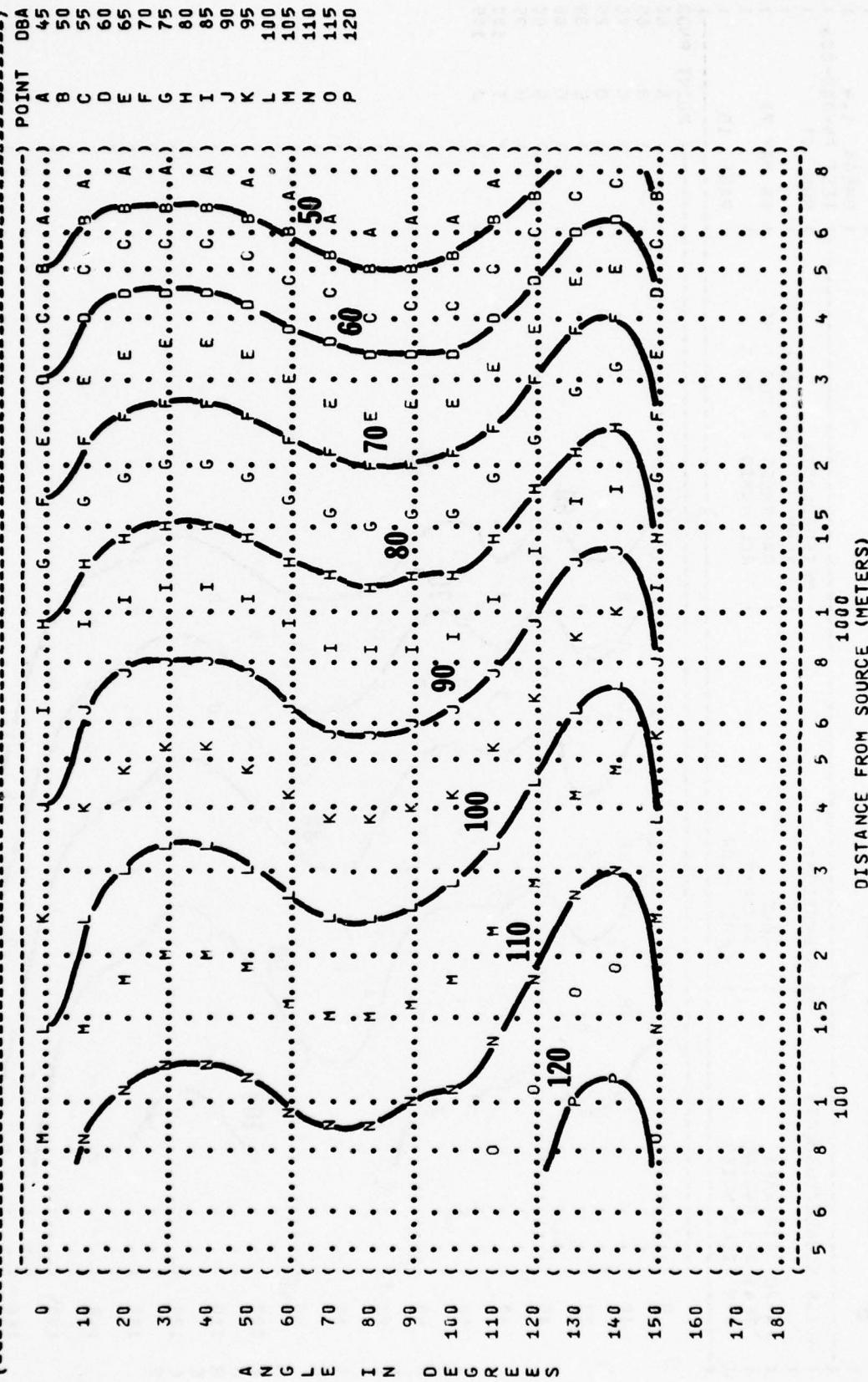
IDENTIFICATION:

OMEGA 1-4  
TEST 75-002-051  
RUN 01

METEOROLOGY:

TEMP = 15 C  
BAR PRESS = .760 M HG  
REL HUMID = 70 %

PAGE 15



**FIGURE 8** PERCEIVED NOISE LEVEL WITH SMOOTH TONE CORRECTION (PNLT) EQUAL LEVEL CONTOURS (PNDB)

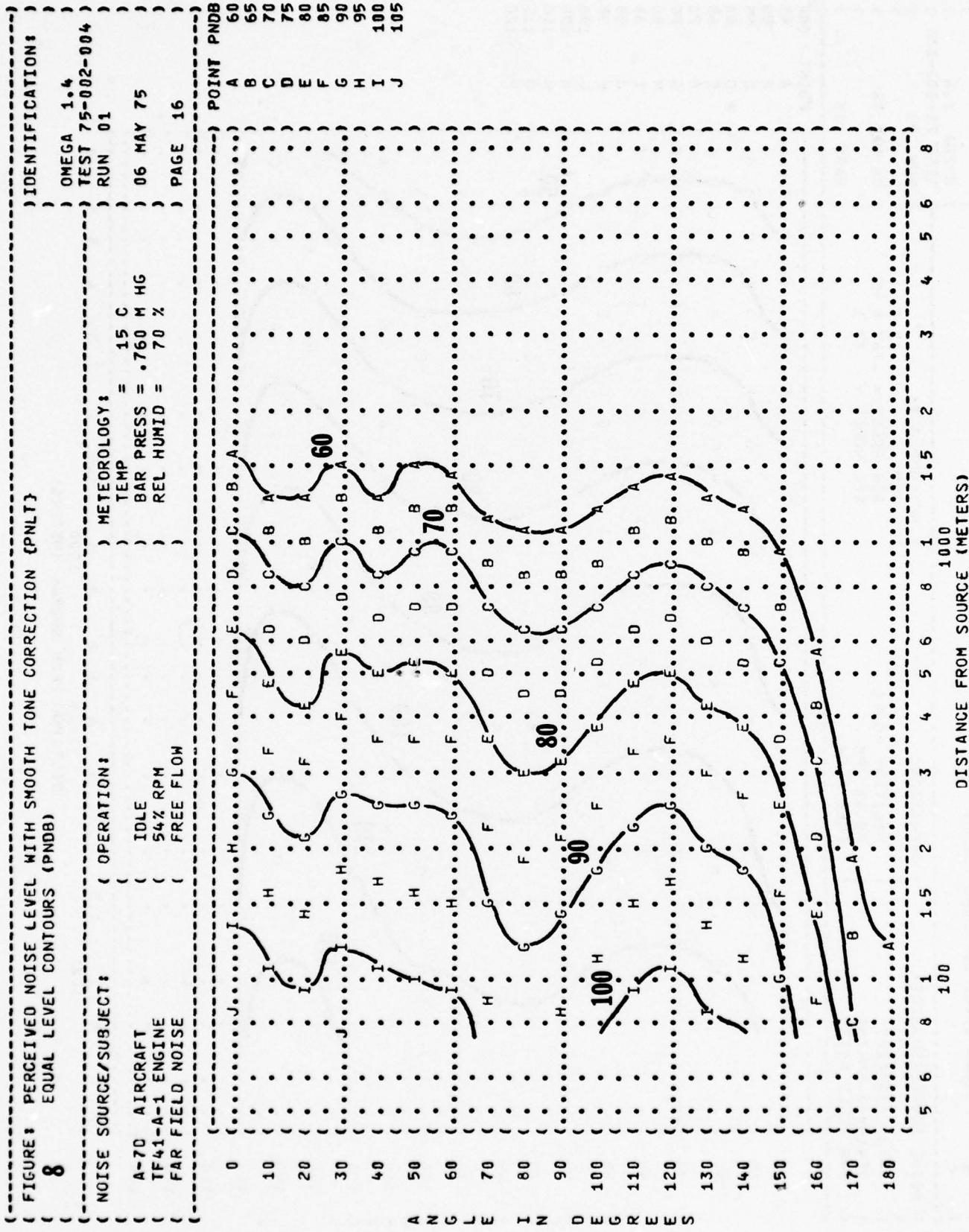


FIGURE 8 PERCEIVED NOISE LEVEL WITH SMOOTH TONE CORRECTION (PNLT)

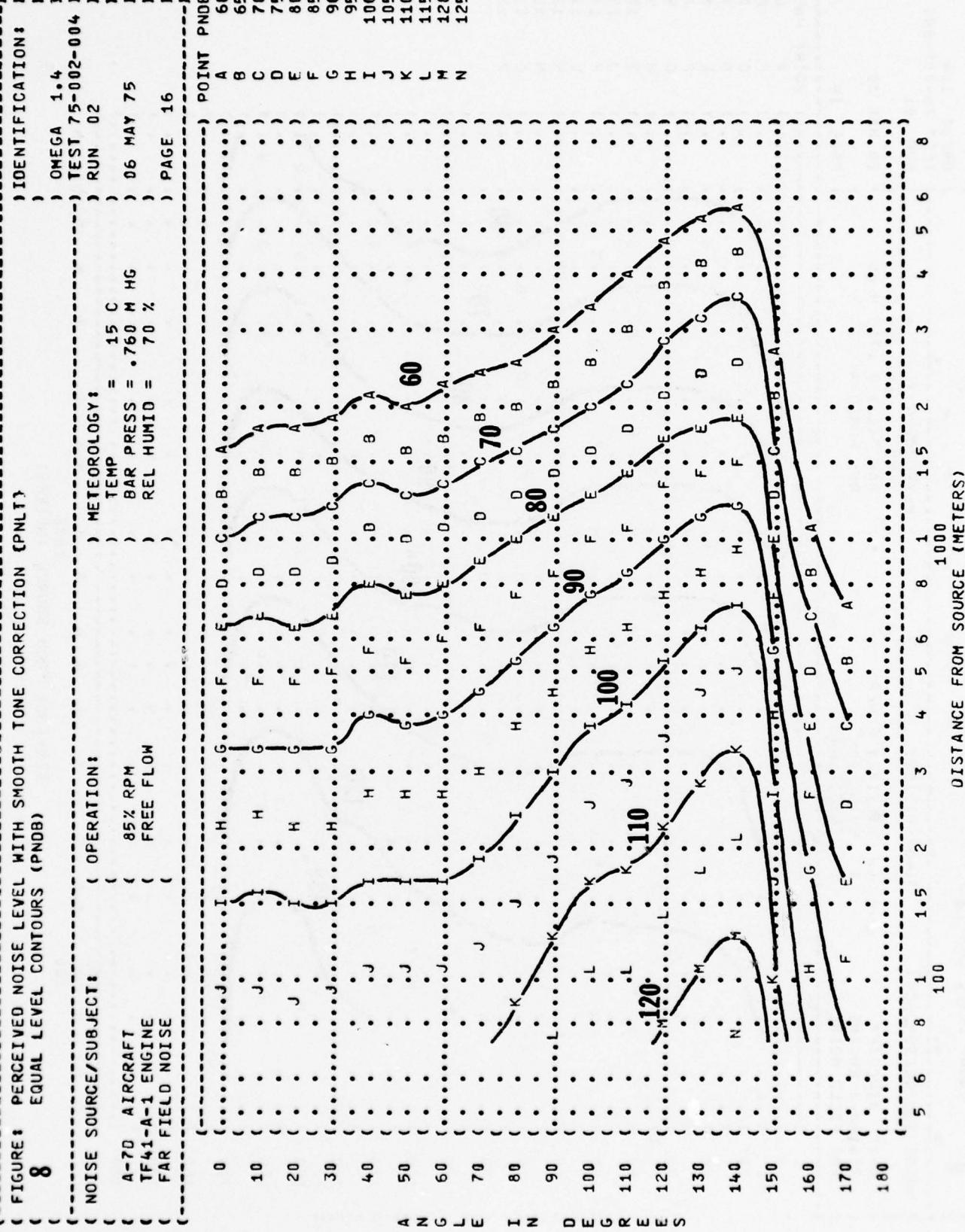
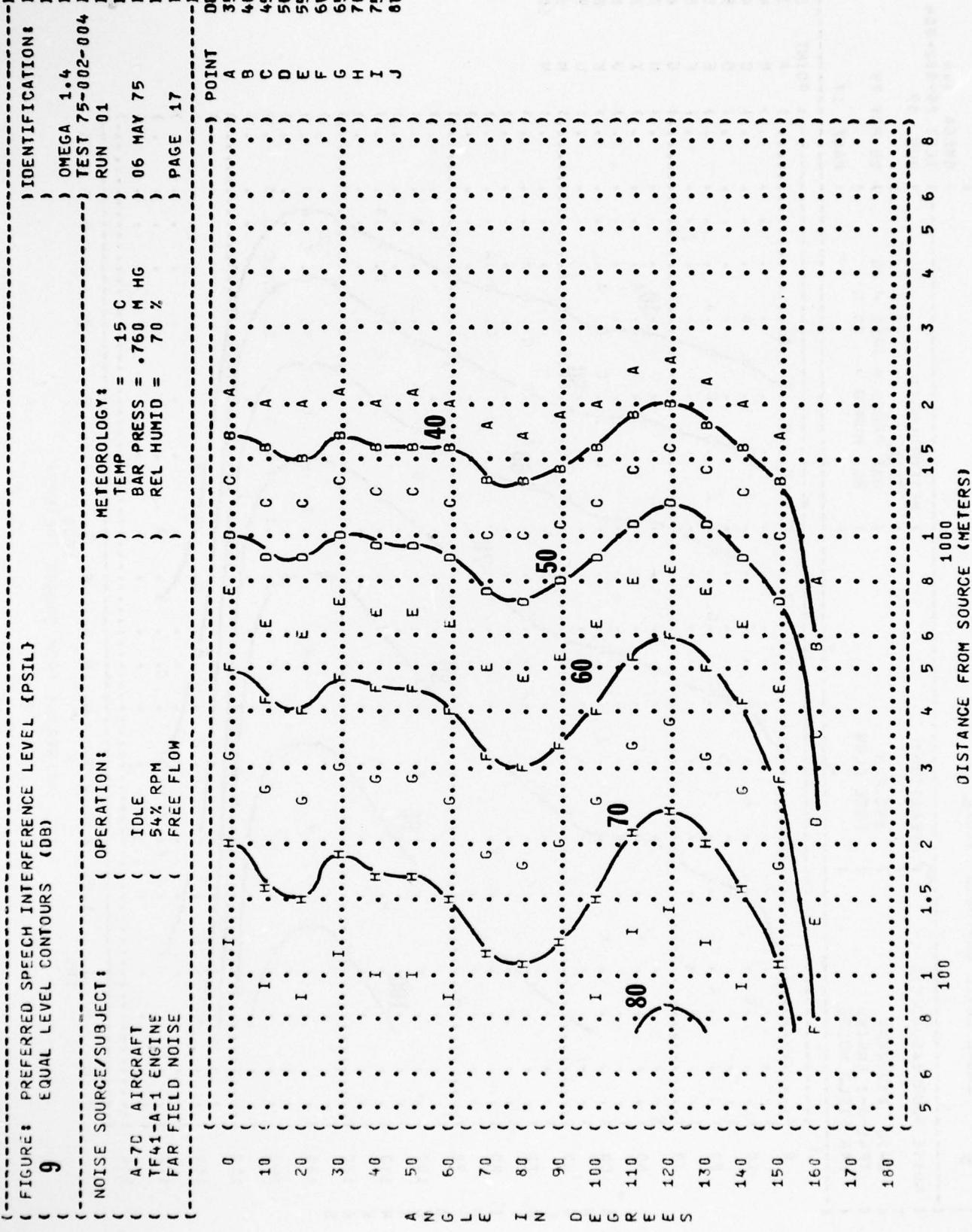




FIGURE 9 PREFERRED SPEECH INTERFERENCE LEVEL (PSIL) EQUAL LEVEL CONTOURS (DB)



**FIGURE 1: PREFERRED SPEECH INTERFERENCE LEVEL (PSIL) EQUAL LEVEL CONTOURS (0dB)**

| NOISE SOURCE/SUBJECT: | OPERATION: |
|-----------------------|------------|
| A-7D AIRCRAFT         | 85% RPM    |
| TF41-A-1 ENGINE       | FREE FLOW  |
| FAR FIELD NOISE       |            |

|                        |            |                    |
|------------------------|------------|--------------------|
| NOISE SOURCES/SUBJECT: | OPERATION: | METEOROLOGY:       |
| A-7D AIRCRAFT          | 85% RPM    | TEMP = 15 C        |
| TF41-A-1 ENGINE        | FREE FLOW  | BAR PRESS = 760 HG |
| FAR FIELD NOISE        |            | REL HUMID = 70 %   |
|                        |            |                    |
|                        |            | RUN 02             |
|                        |            | 06 MAY 75          |
|                        |            | PAGE 17            |

|                        |            |                    |
|------------------------|------------|--------------------|
| NOISE SOURCES/SUBJECT: | OPERATION: | METEOROLOGY:       |
| A-7D AIRCRAFT          | 85% RPM    | TEMP = 15 C        |
| TF41-A-1 ENGINE        | FREE FLOW  | BAR PRESS = 760 HG |
| FAR FIELD NOISE        |            | REL HUMID = 70 %   |
|                        |            |                    |
|                        |            | RUN 02             |
|                        |            | 06 MAY 75          |
|                        |            | PAGE 17            |

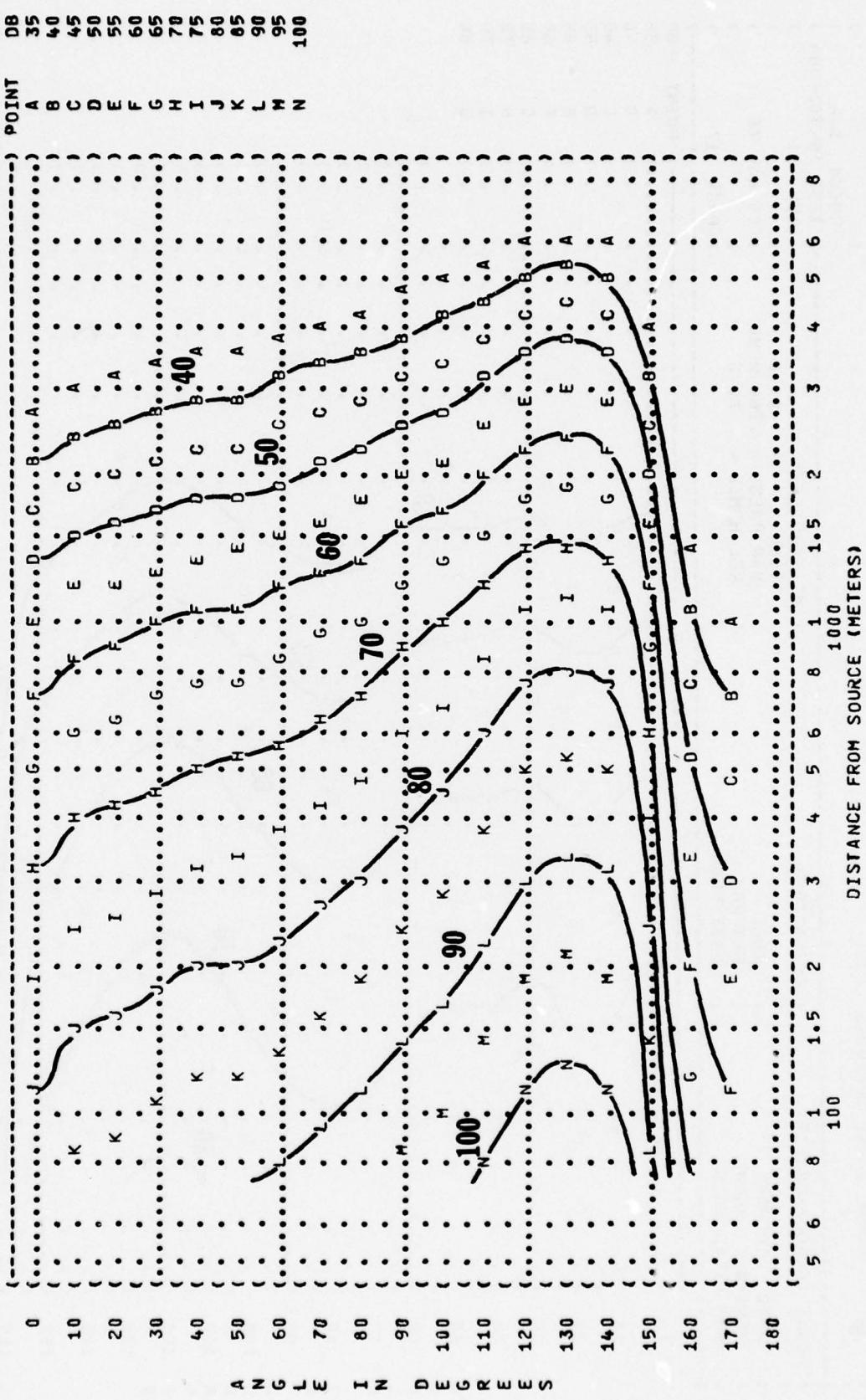


FIGURE: PREFERRED SPEECH INTERFERENCE LEVEL (PSIL)  
**9**  
EQUAL LEVEL CONTOURS (DB)

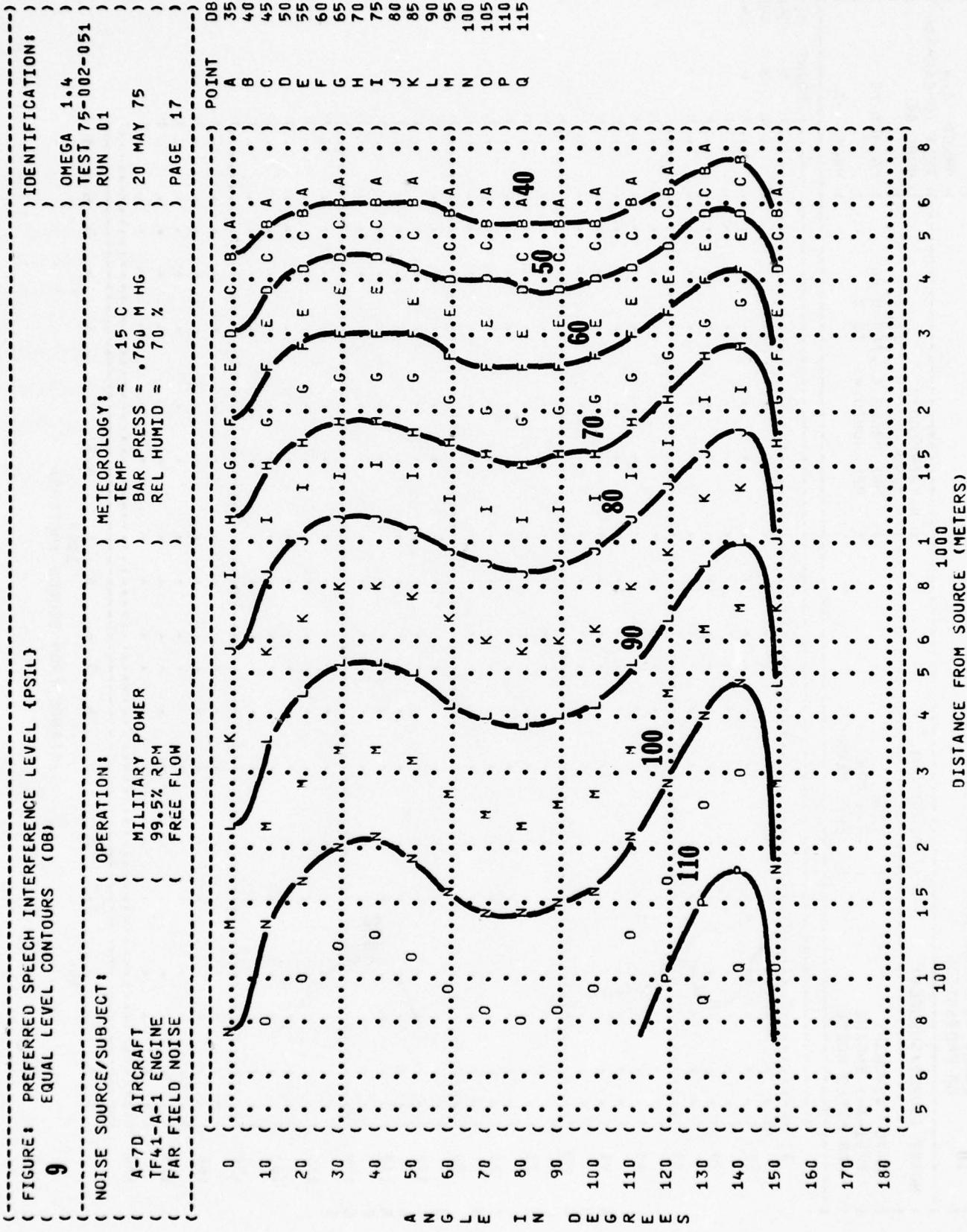




FIGURE: MAXIMUM PERMISSIBLE TIME {T} FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)  
**10** EQUAL TIME CONTOURS (MINUTES)



OPERATION:  
 IDLE  
 54% RPM  
 FREE FLOW

METEOROLOGY:  
 TEMP = 15 C  
 BAR PRESS = .760 M HG  
 REL HUMID = 70 %

TEST 75-002-004  
 RUN 01  
 OMEGA 1.4  
 PAGE 8

PERSONNEL MAY BE EXPOSED UP TO 960 MINUTES PER DAY  
 AT ALL DISTANCES FROM SOURCE EQUAL TO OR GREATER THAN 75 METERS  
 FOR ALL ANGLES EVALUATED (INDICATED BY < AT LEFT)  
 UNDER THE FOLLOWING EAR PROTECTION CONDITIONS:

MINIMUM QPL EAR MUFFS

AMERICAN OPTICAL 1700 EAR MUFFS

V-51R EAR PLUGS

COMFIT TRIPLE FLANGE EAR PLUGS

H-133 GROUND COMMUNICATION UNIT

5 6 8 1 1.5 2 3 4 5 6 8 1 1.5 2 3 4 5 6 8  
 100 1000 DISTANCE FROM SOURCE (METERS)

FIGURE: MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)  
 10 EQUAL TIME CONTOURS (MINUTES)  
 NO PROTECTION

NOISE SOURCE/SUBJECT: OPERATION:  
 A-70 AIRCRAFT 85% RPM  
 TF41-A-1 ENGINE FREE FLOW  
 FAR FIELD NOISE

METEOROLOGY:  
 TEMP = 15 C  
 BAR PRESS = .760 N HG  
 REL HUMID = 70 %

IDENTIFICATION:  
 OMEGA 1.4  
 TEST 75-802-004  
 RUN 02  
 PAGE 7

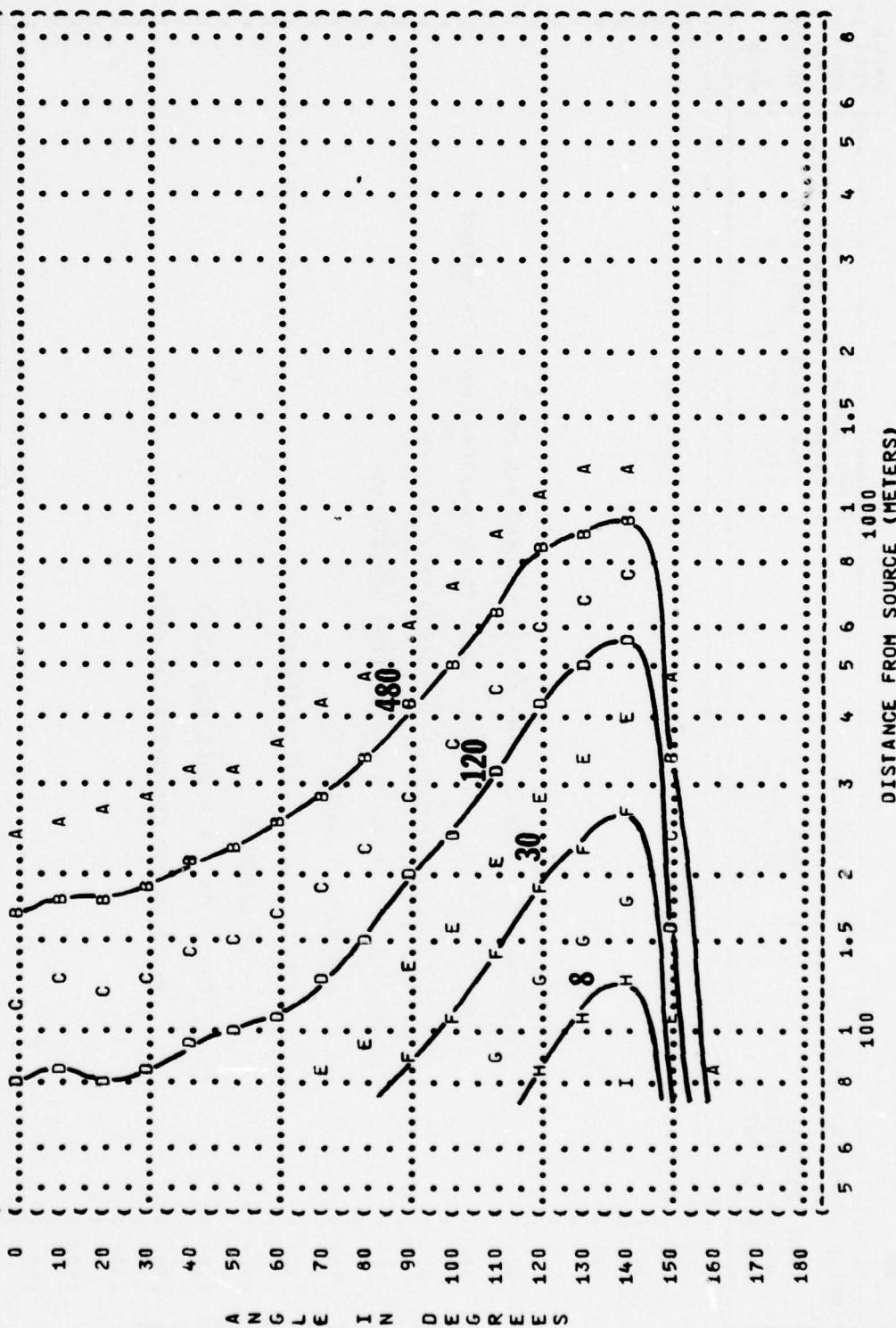


FIGURE 8 MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)  
**10** EQUAL TIME CONTOURS (MINUTES)  
 MINIMUM QPL EAR MUFFS

NOISE SOURCE/SUBJECT: A-70 AIRCRAFT  
 TF41-N-1 ENGINE  
 FAR FIELD NOISE

OPERATIONS: 85% RPM  
 FREE FLOW

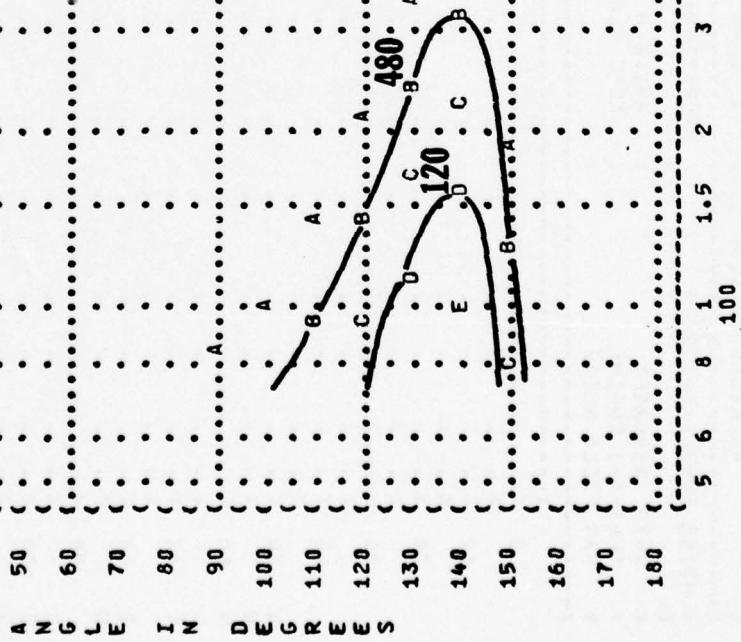
IDENTIFICATION:  
 OMEGA 14  
 TEST 75-002-004  
 RUN 02

METEOROLOGY:  
 TEMP = 15 C  
 BAR PRESS = .760 M HG  
 REL HUMID = 70 %

PAGE 8

POINT MIN  
 A 960  
 B 480  
 C 240  
 D 120  
 E 60

DISTANCE FROM SOURCE (METERS)



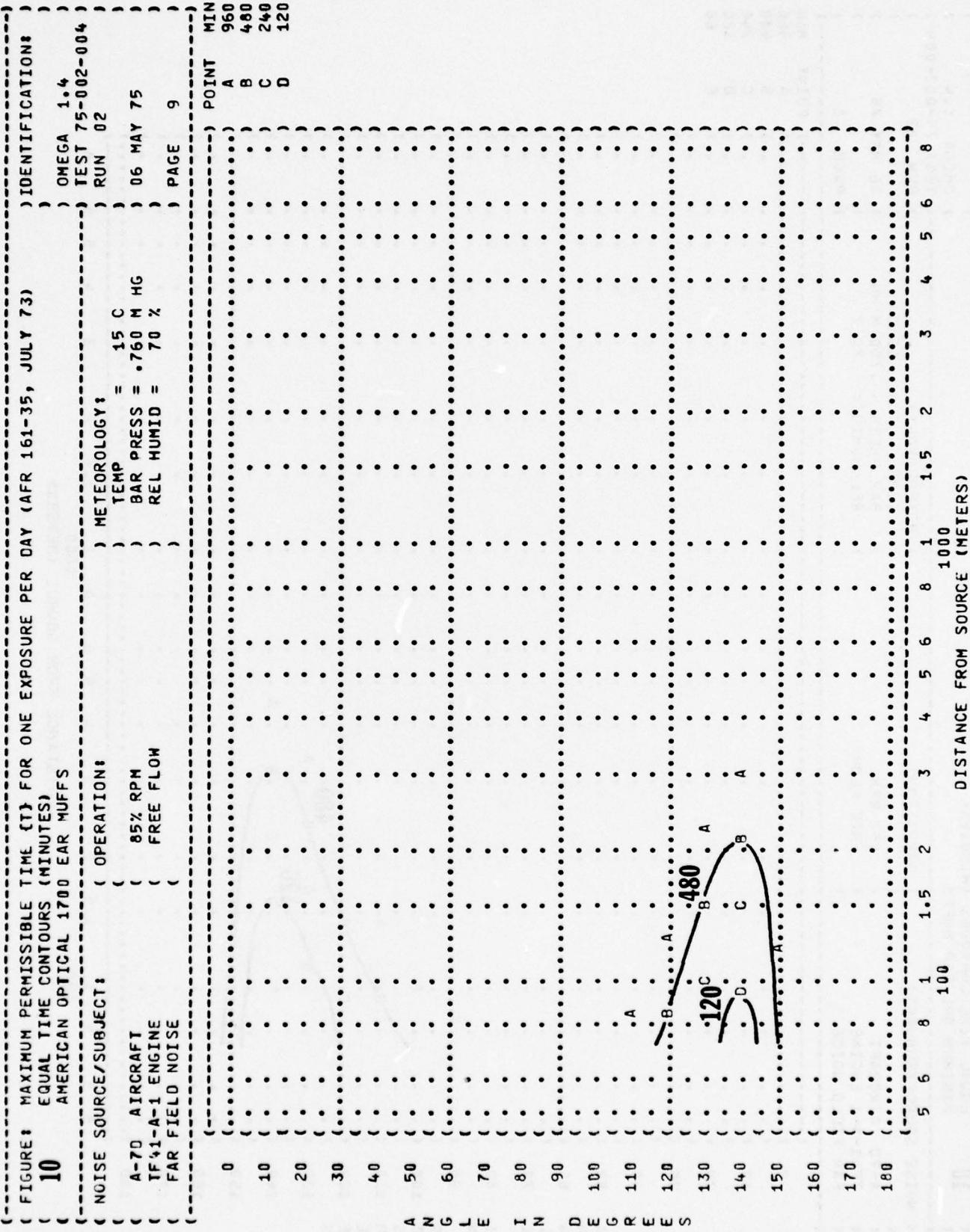


FIGURE: MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)  
**10** EQUAL TIME CONTOURS (MINUTES)  
**V-51R EAR PLUGS**

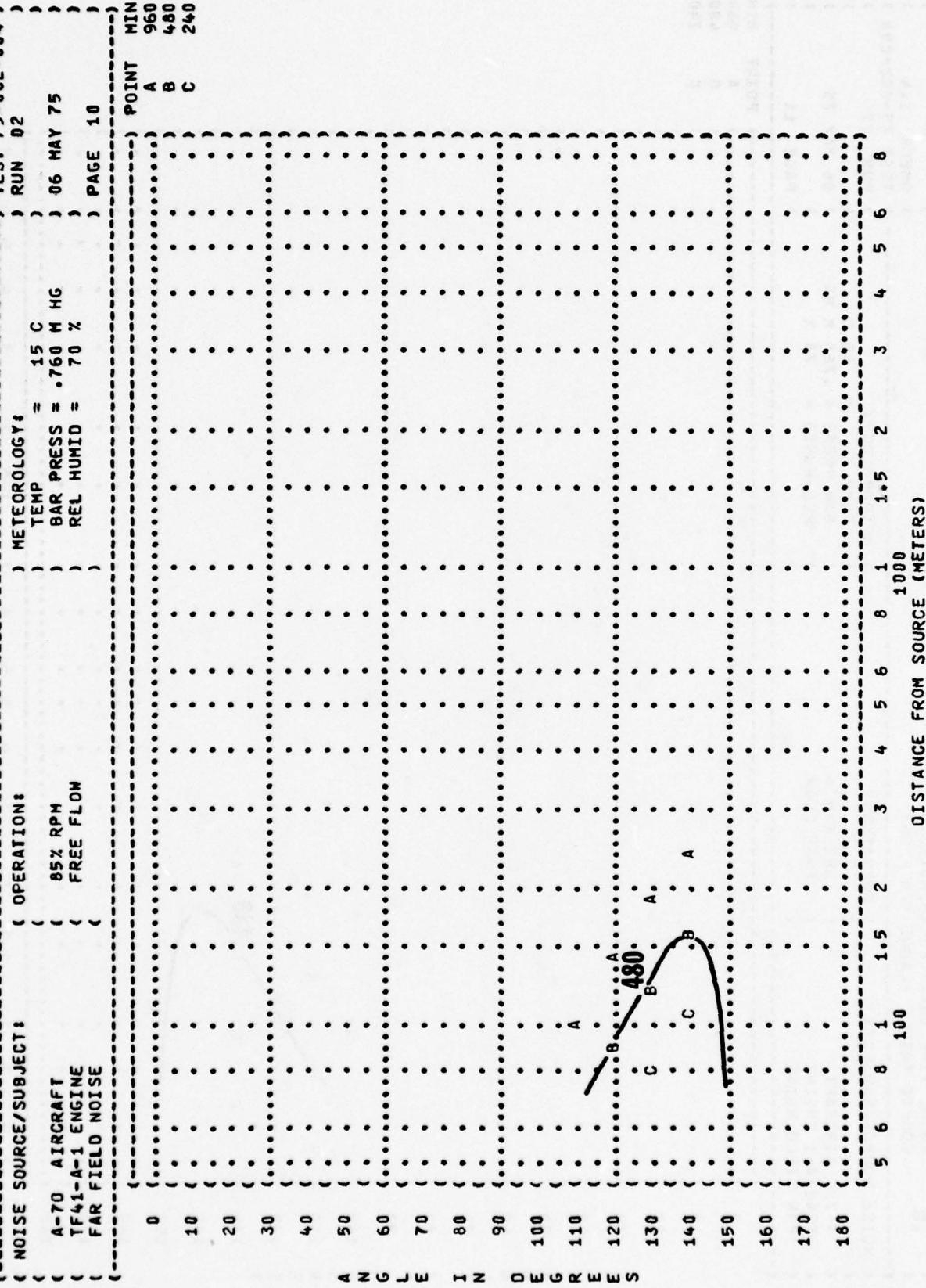


FIGURE: MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)  
**10**  
 EQUAL TIME CONTOURS (MINUTES)  
 COMFIT TRIPLE FLANGE EAR PLUGS  
 NOISE SOURCE/SUBJECT:  
 A-70 AIRCRAFT  
 TF41-A-1 ENGINE  
 FAR FIELD NOISE

OPERATION:  
 85% RPM  
 FREE FLOW

METEOROLOGY:  
 TEMP = 15 C  
 BAR PRESS = .760 M HG  
 REL HUMID = 70 %

TEST 75-002-004  
 RUN 02  
 PAGE 11

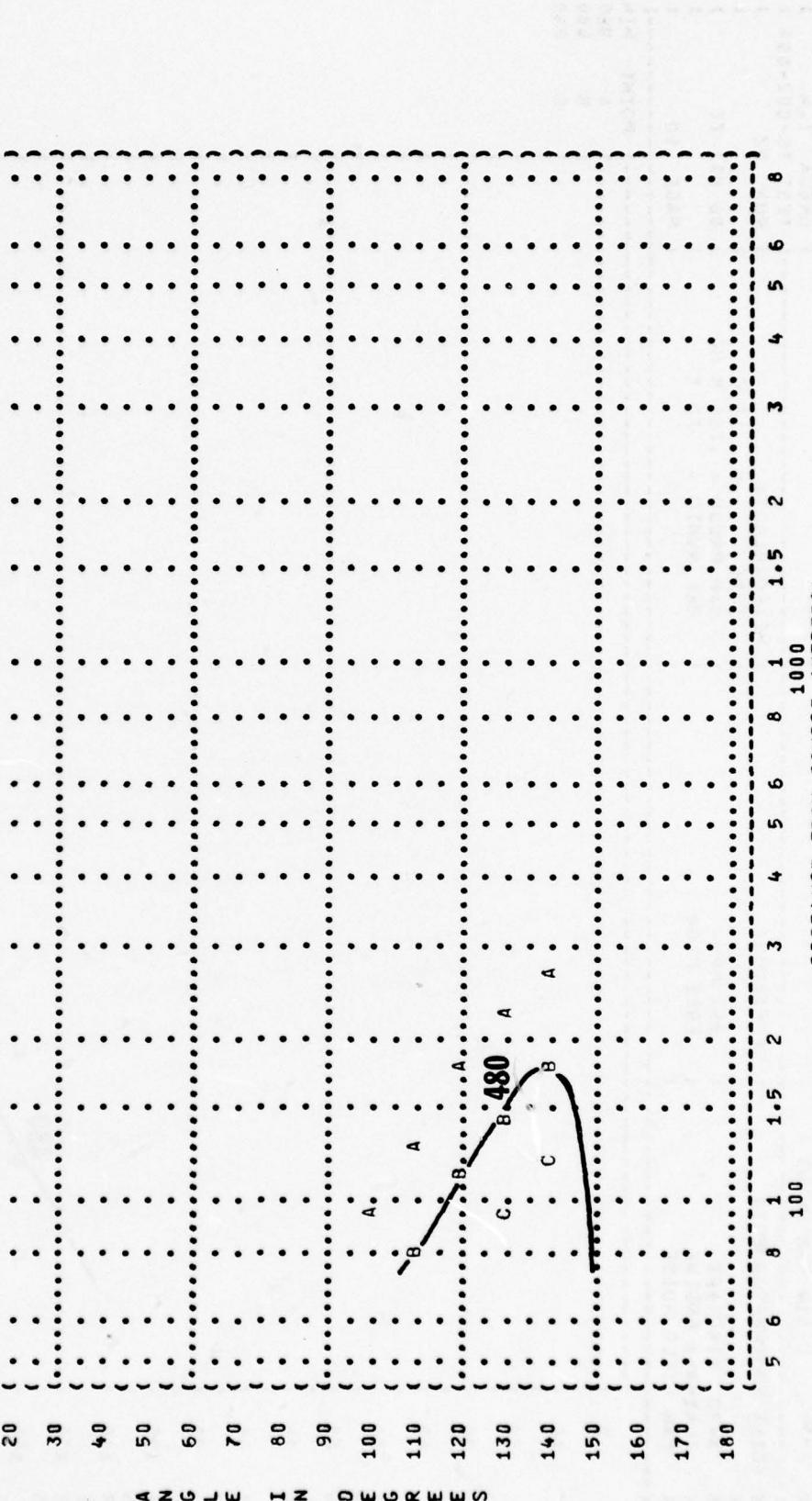


FIGURE 10 MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73) IDENTIFICATION  
 EQUAL TIME CONTOURS (MINUTES)  
 H-133 GROUND COMMUNICATION UNIT

NOISE SOURCE/SUBJECT:

A-70 AIRCRAFT  
TF41-A-1 ENGINE  
FAR FIELD NOISE

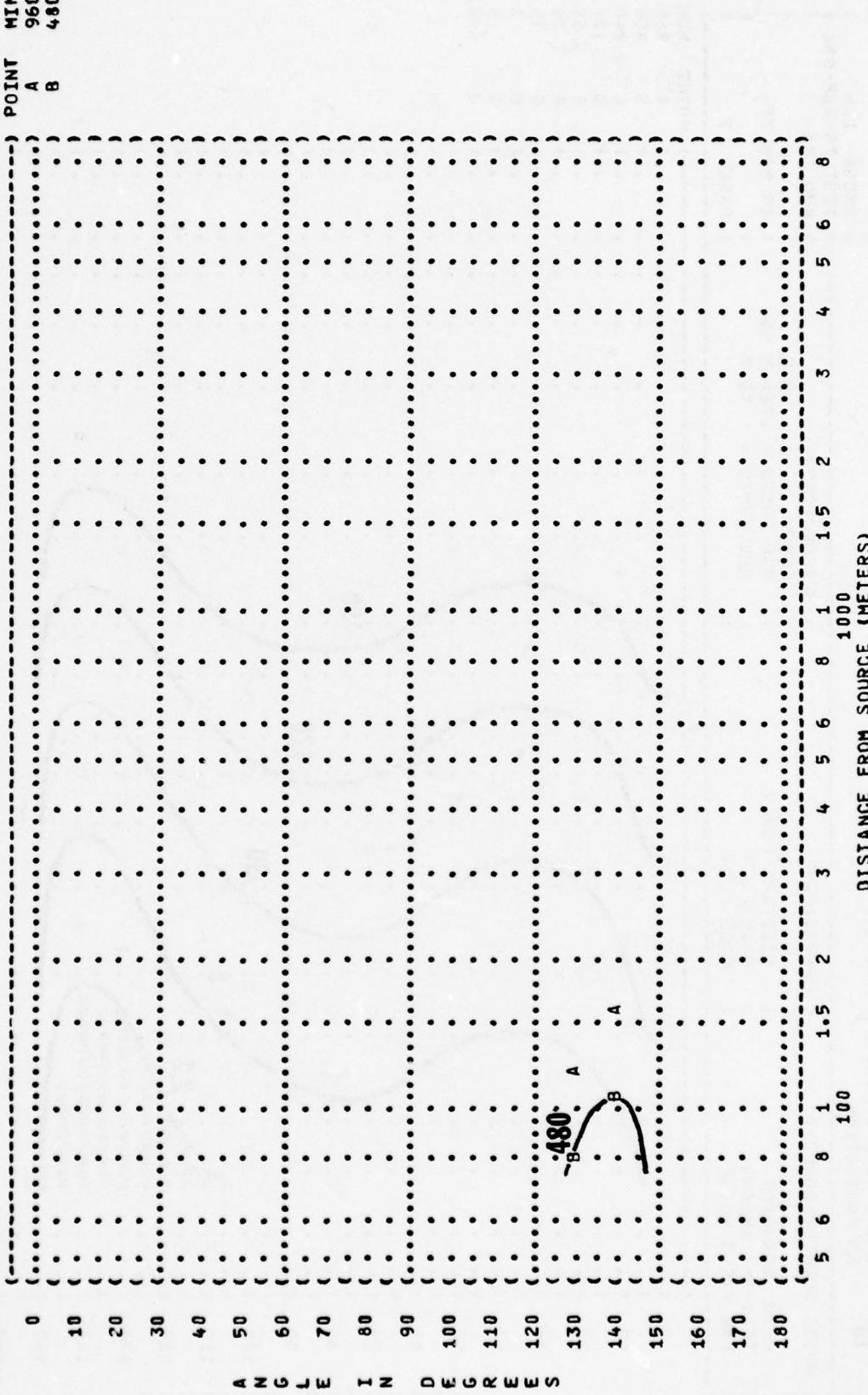
OPERATION:

85% RPM  
FREE FLOW

OMEGA 1.4  
TEST 75-002-004

RUN 02

PAGE 12



{ FIGURE: MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)  
 10 EQUAL TIME CONTOURS (MINUTES)  
 NO PROTECTION

NOISE SOURCE/SUBJECT:

A-7D AIRCRAFT  
 TF41-A-1 ENGINE  
 FAR FIELD NOISE

OPERATION:

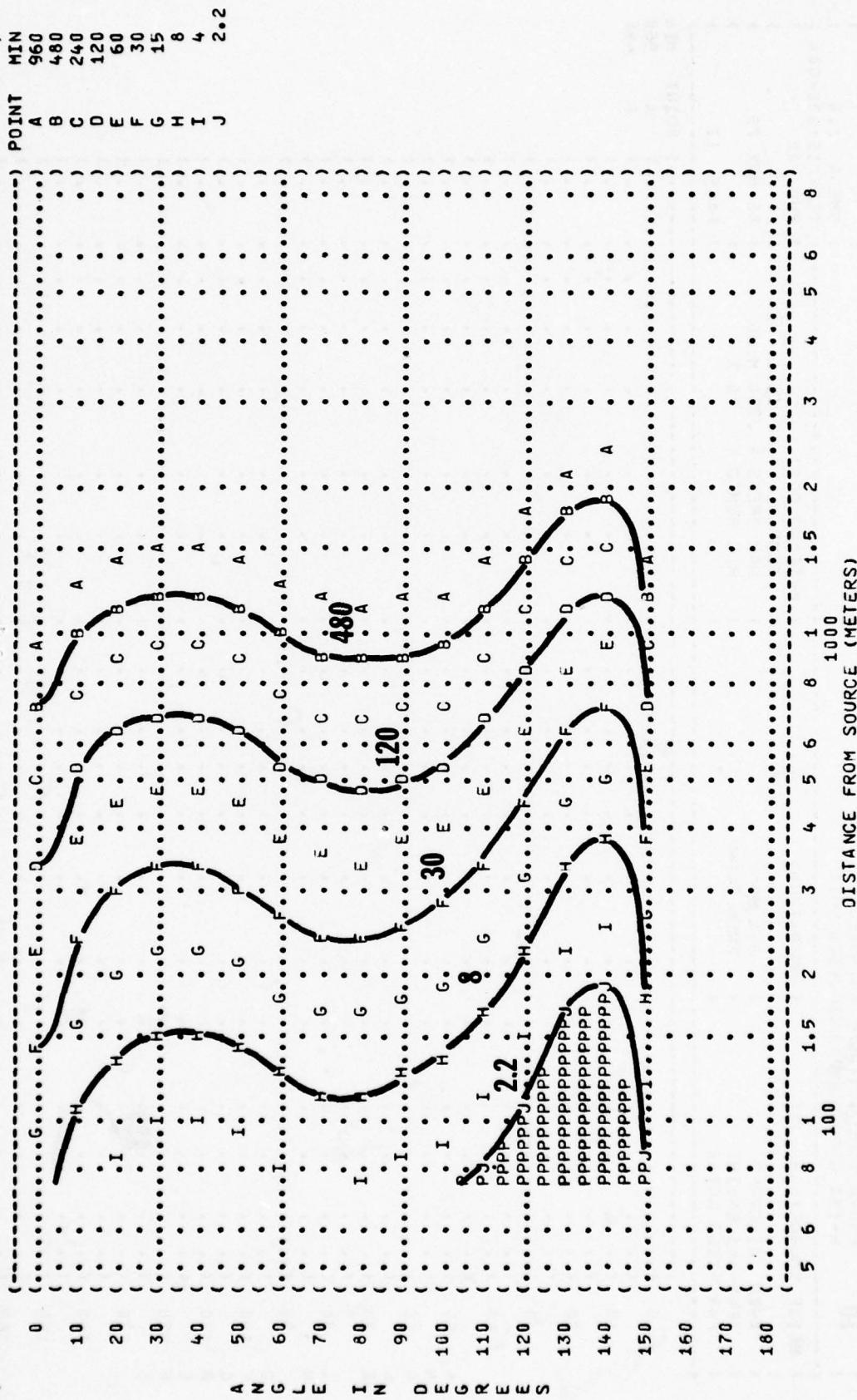
MILITARY POWER  
 99.5% RPM  
 FREE FLOW

METEOROLOGY:

TEMP = 15 C  
 BAR PRESS = .760 M HG  
 REL HUMID = 70 %

IDENTIFICATION:

OMEGA 1-4  
 TEST 75-002-051  
 RUN 01

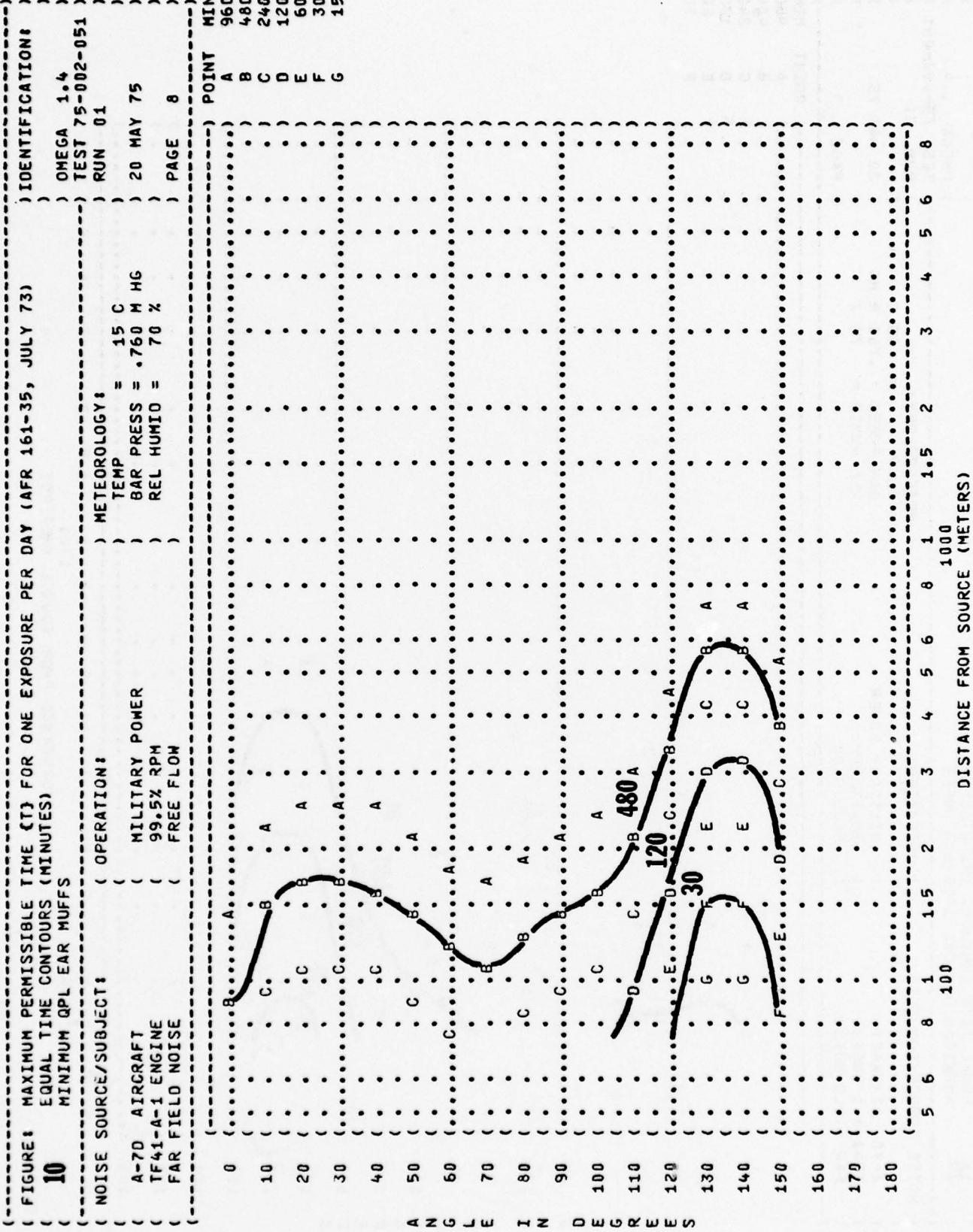


P ADDITIONAL EAR PROTECTION REQUIRED.

DISTANCE FROM SOURCE (METERS)

1000

5 6 8 1 1.5 2 3 4 5 6 8 1 1.5 2 3 4 5 6 8



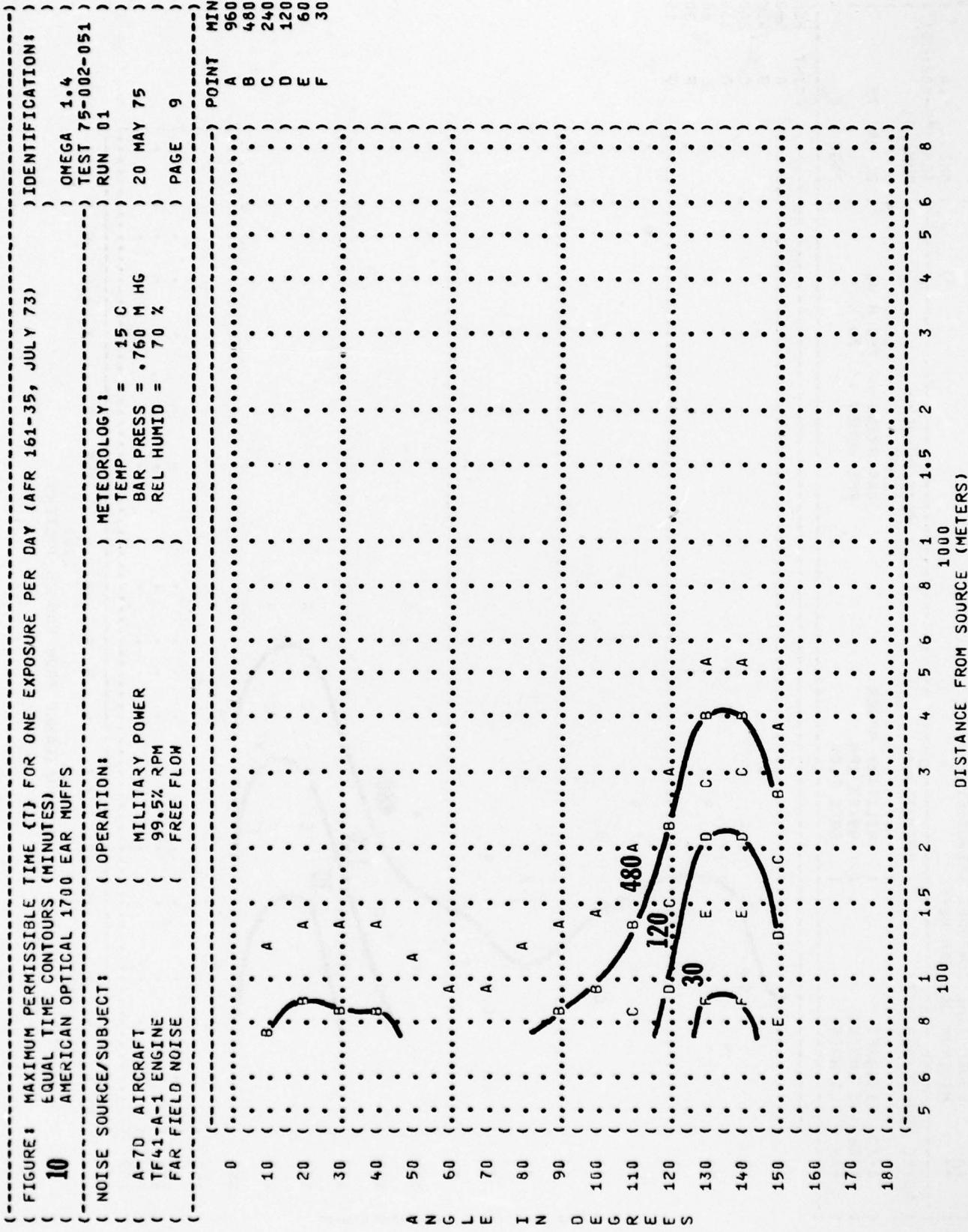


FIGURE: MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)  
 EQUAL TIME CONTOURS (MINUTES)  
**10**  
 V-51R EAR PLUGS

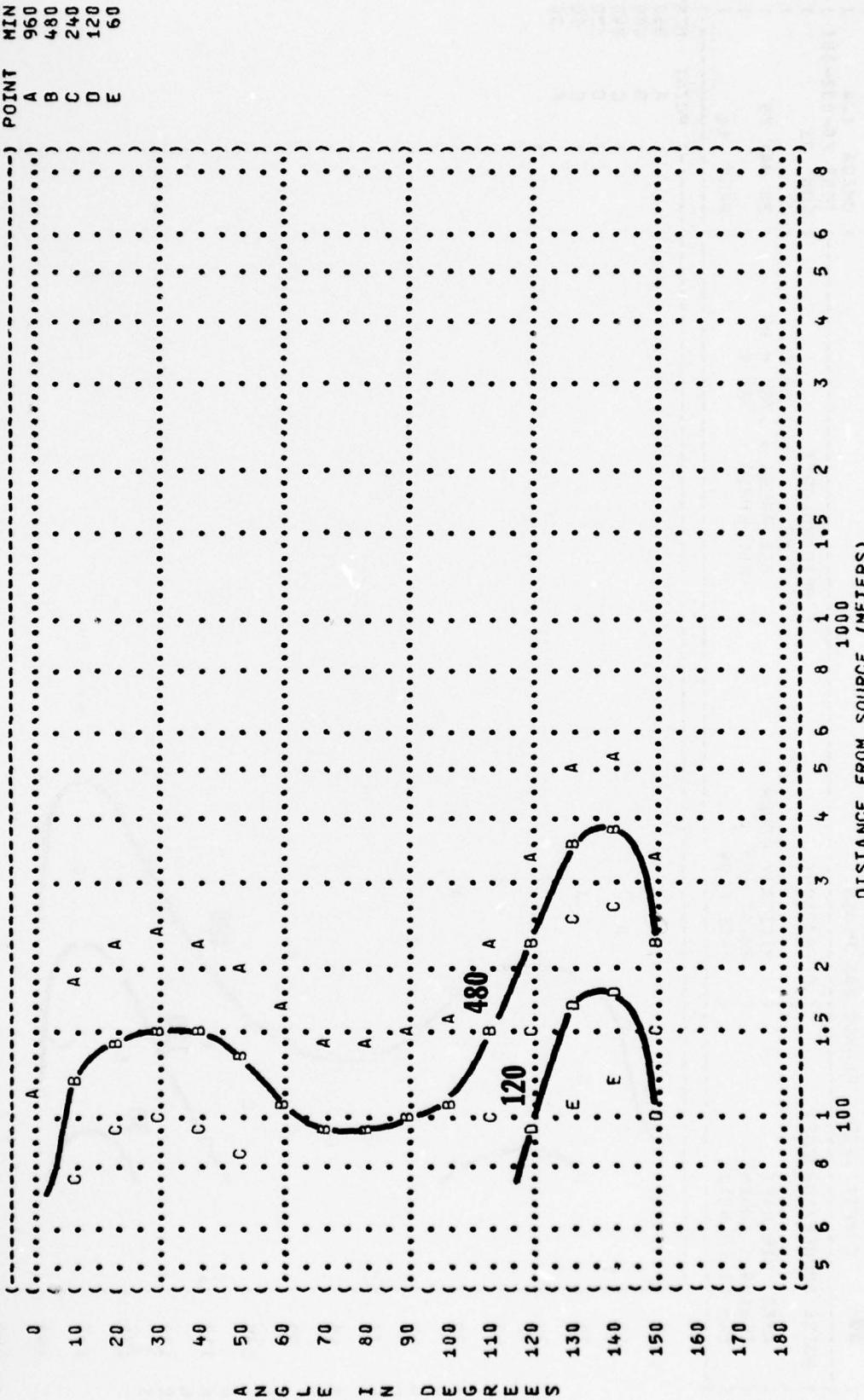
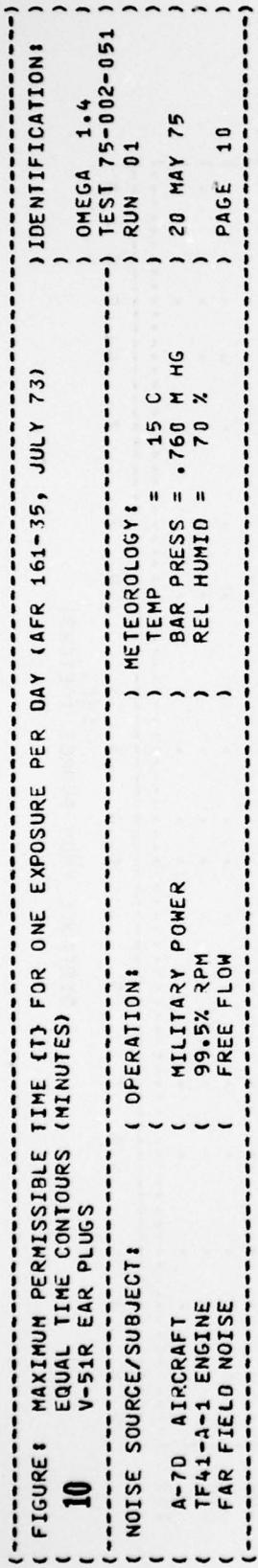


FIGURE 8 MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)  
**10** EQUAL TIME CONTOURS (MINUTES)  
 COMFIT TRIPLE FLANGE EAR PLUGS

| NOISE SOURCE/SUBJECT:                               | OPERATION:                               | METEOROLOGY:   | POINT   | MIN             |
|---|--|--|---------|-----------------|
| A-70 AIRCRAFT<br>TF41-A-1 ENGINE<br>FAR FIELD NOISE | MILITARY POWER<br>99.5% RPM<br>FREE FLOW | TEMP = 15 C<br>BAR PRESS = .760 M HG<br>REL HUMID = 70 % | RUN 01  | TEST 75-002-051 |
|   |  |  | PAGE 11 |                 |

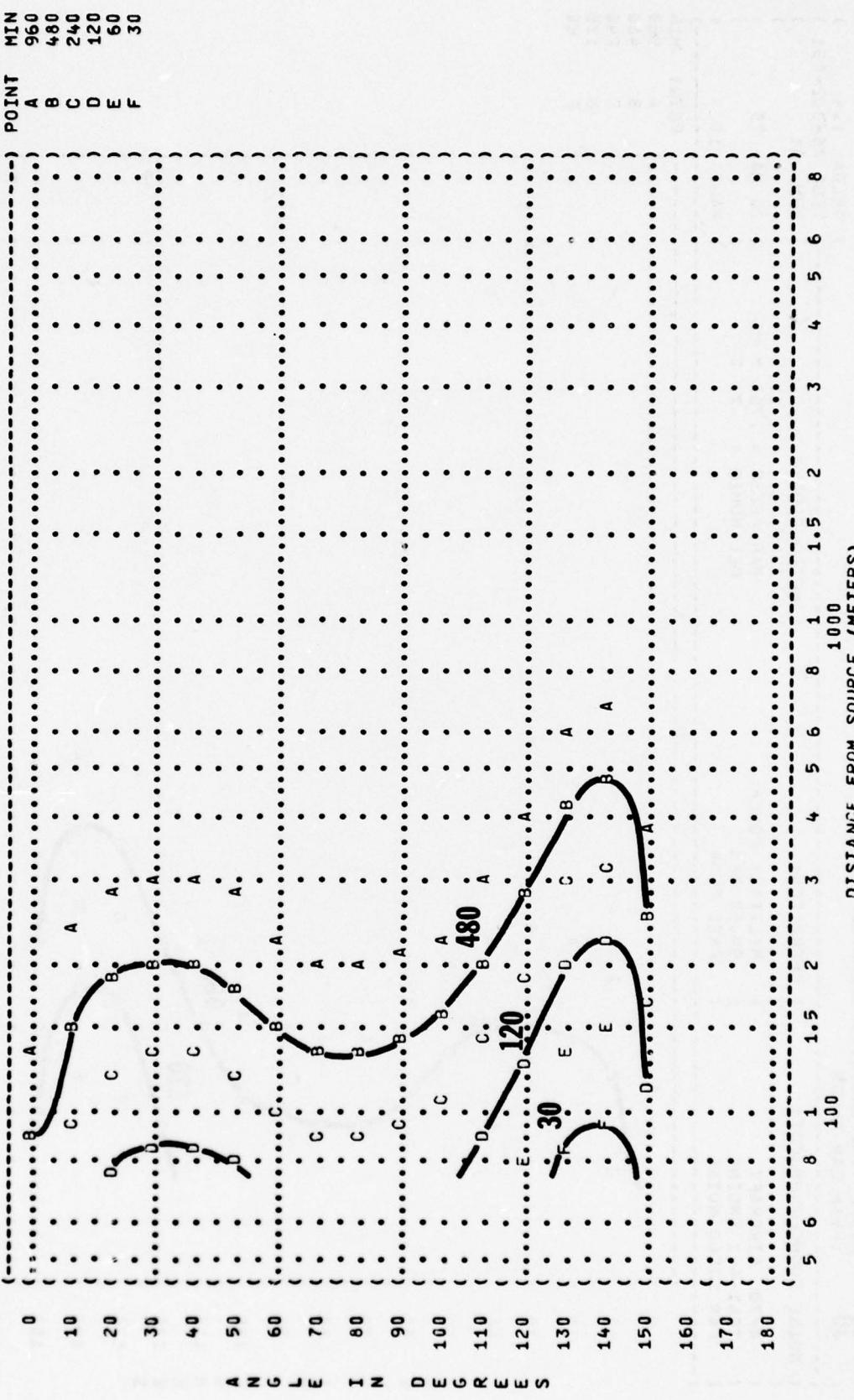


FIGURE: MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)  
**10**  
 EQUAL TIME CONTOURS (MINUTES)  
 H-133 GROUND COMMUNICATION UNIT  
 NOISE SOURCE/SUBJECT:  
 A-7D AIRCRAFT  
 TF41-A-1 ENGINE  
 FAR FIELD NOISE

OPERATION: MILITARY POWER  
99.5% RPM  
FREE FLOW

METEOROLOGY:  
TEMP = 15 C  
BAR PRESS = .760 M HG  
REL HUMID = 70 %

RUN 01  
TEST 75-002-051  
PAGE 12

POINT MIN  
A 960  
B 480  
C 240  
D 120  
E 60

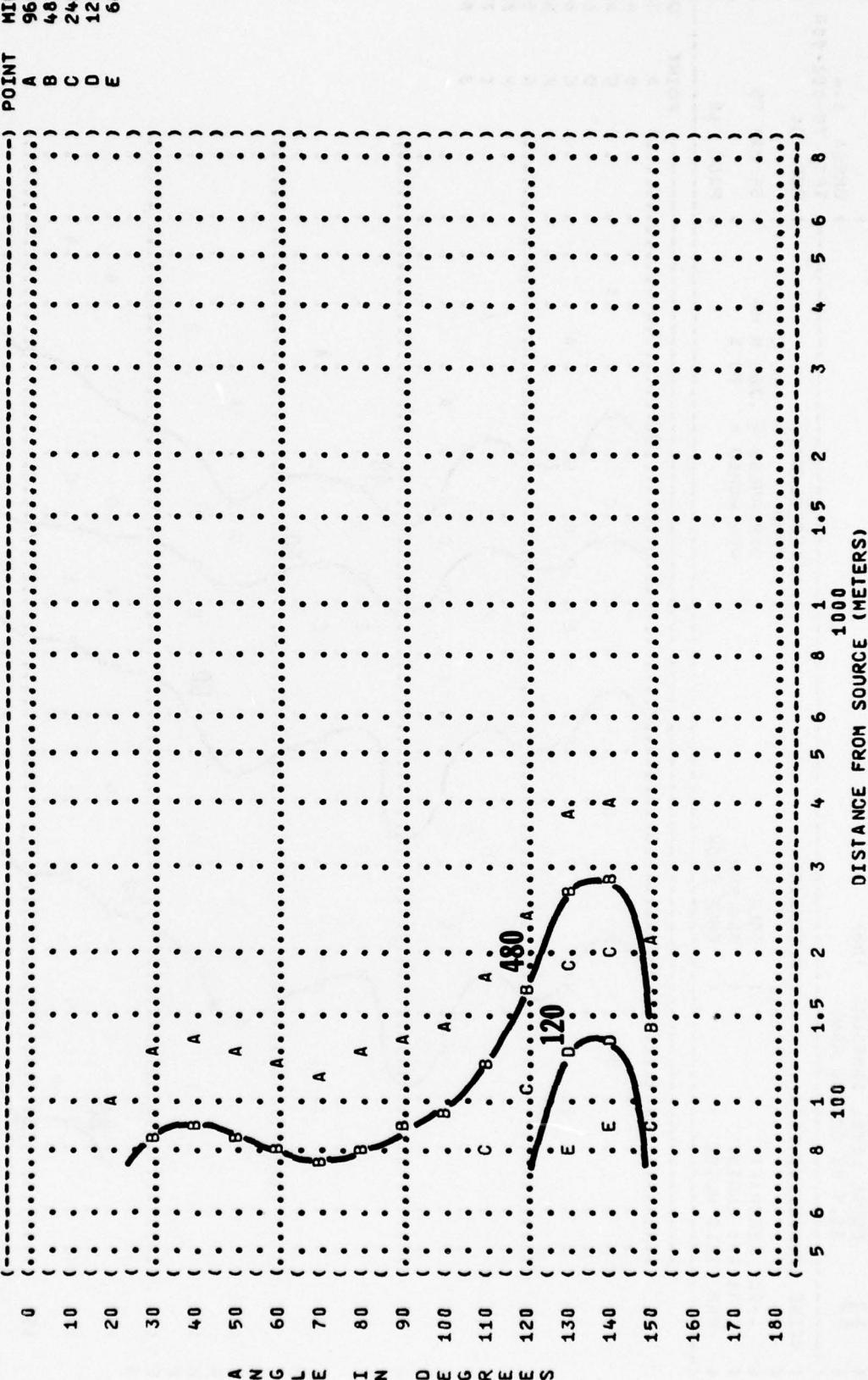
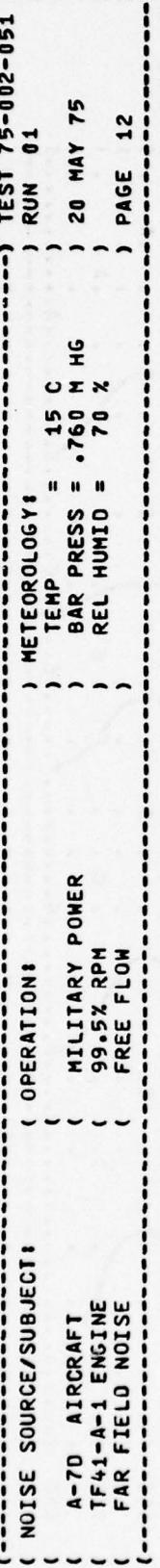


FIGURE: SOUND PRESSURE LEVEL (SPL)  
**11** EQUAL LEVEL CONTOURS (DB)  
 31.5 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:  
**A-7D AIRCRAFT**  
**TF41-A-1 ENGINE**  
**FAR FIELD NOISE**

OPERATION:  
**IDLE**  
**54% RPM**  
**FREE FLOW**

IDENTIFICATION:  
**OMEGA 1<sup>•4</sup>**  
**TEST 75-002-004**  
**RUN 01**  
**06 MAY 75**  
**PAGE 18**

METEOROLOGY:  
**TEMP = 15 C**  
**BAR PRESS = .760 M HG**  
**REL HUMID = 70 %**

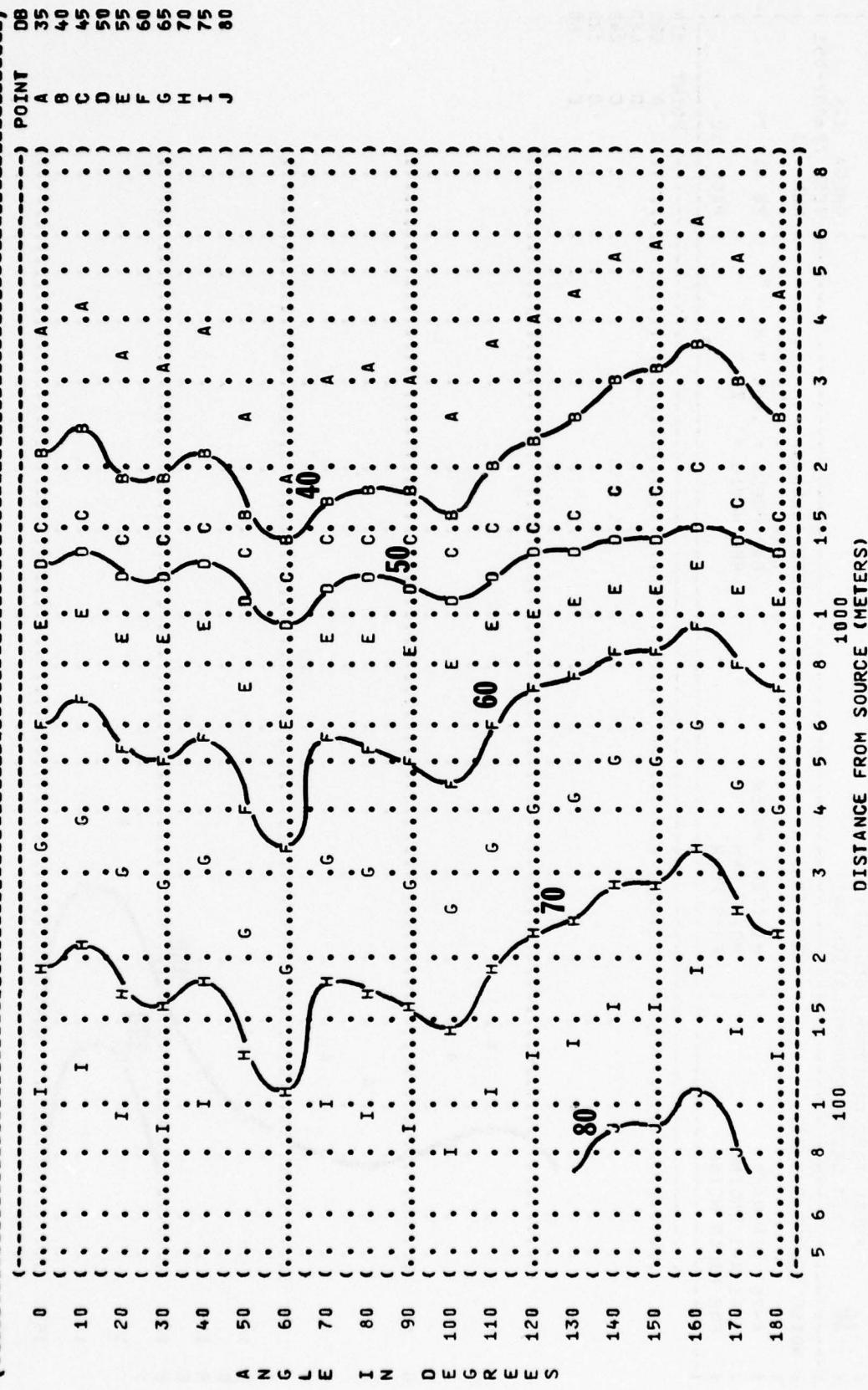


FIGURE: SOUND PRESSURE LEVEL (SPL)  
**11**  
 EQUAL LEVEL CONTOURS (08)  
 63 HZ OCTAVE BAND

NOISE SOURCE/SUBJECT:  
**A-70 AIRCRAFT**  
**TF41-A-1 ENGINE**  
**FAR FIELD NOISE**

OPERATION:  
**IDLE**  
**54% RPM**  
**FREE FLOW**

IDENTIFICATION:  
**OMEGA 1.4**  
**TEST 75-002-004**  
**RUN 01**

METEOROLOGY:  
**TEMP = 15 C**  
**BAR PRESS = .760 M HG**  
**REL HUMID = 70 %**

TEST 75-002-004  
**PAGE 19**

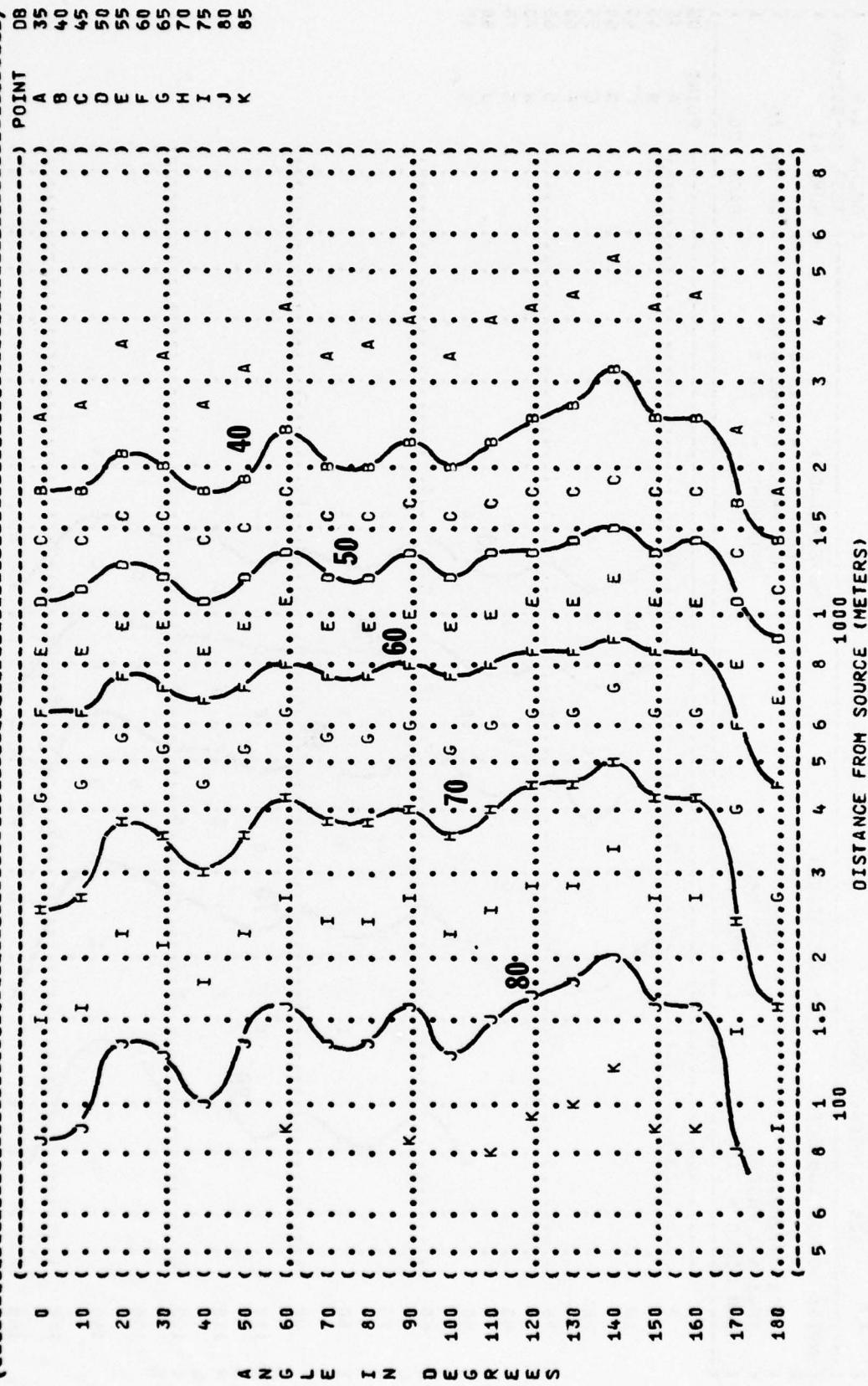


FIGURE: SOUND PRESSURE LEVEL (SPL)  
**11** EQUAL LEVEL CONTOURS (DB)  
 125 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:

A-7D AIRCRAFT  
 TF41-A-1 ENGINE  
 FAR FIELD NOISE

OPERATION:

IDLE  
 54% RPM  
 FREE FLOW

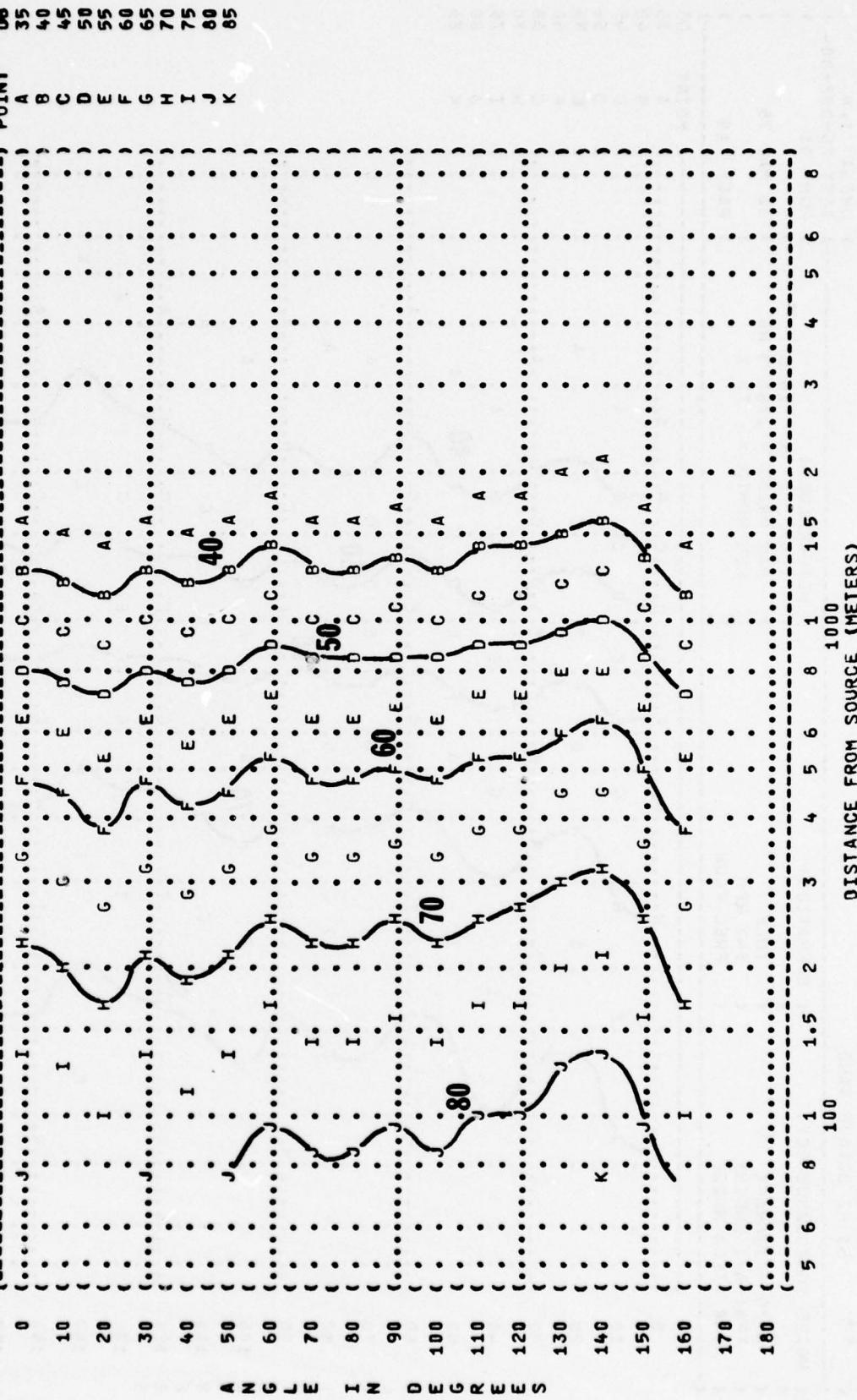
IDENTIFICATION:  
 OMEGA 1.4  
 TEST 75-002-004  
 RUN 01

METEOROLOGY:

TEMP = 15 C  
 BAR PRESS = .760 N HG  
 REL HUMID = 70 %

PAGE 20

POINT 08  
 A 35  
 B 40  
 C 45  
 D 50  
 E 55  
 F 60  
 G 65  
 H 70  
 I 75  
 J 80  
 K 85



DISTANCE FROM SOURCE (METERS)

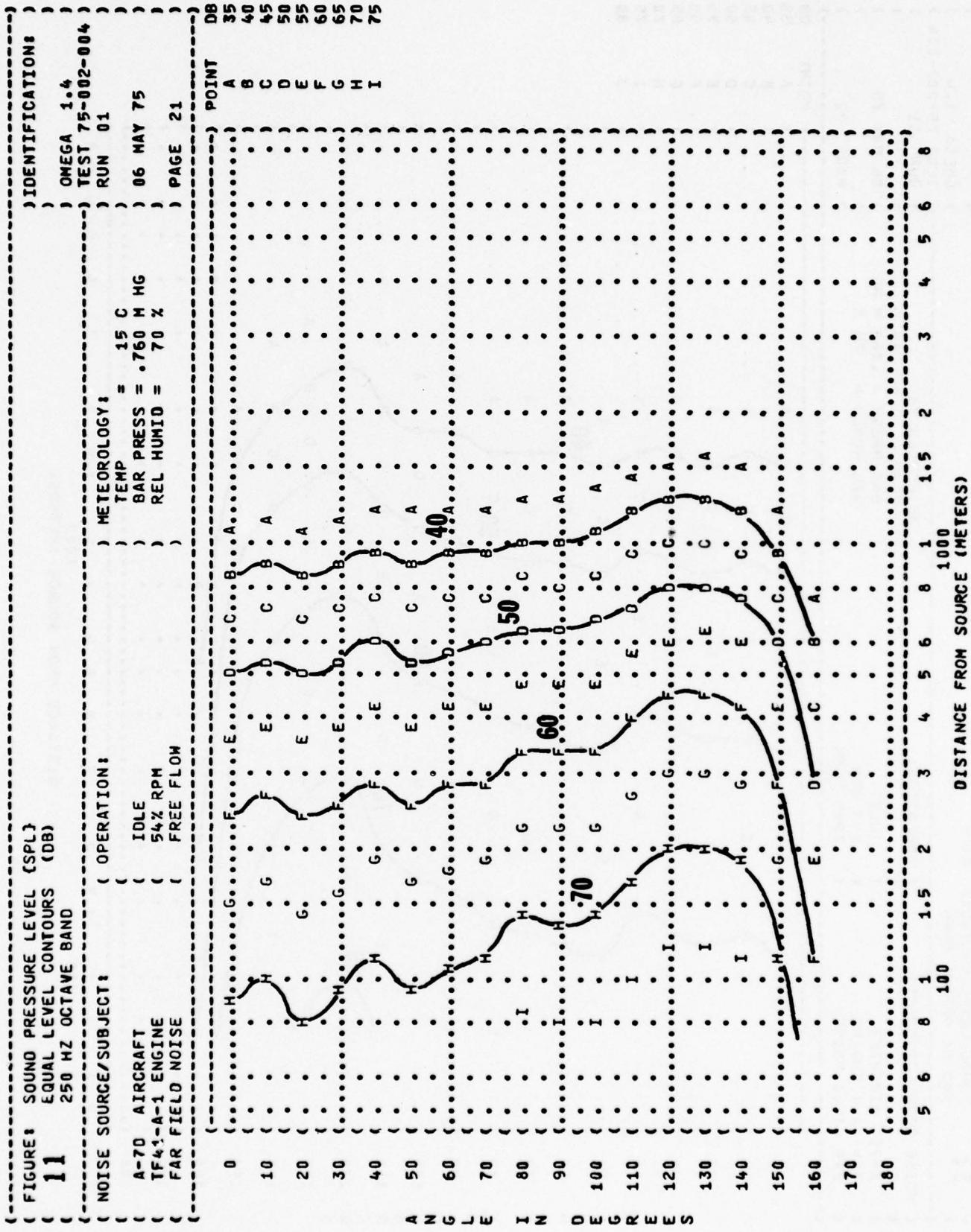


FIGURE: SOUND PRESSURE LEVEL (SPL)  
**11**  
 EQUAL LEVEL CONTOURS (DB)  
 500 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:

A-7D AIRCRAFT  
 TF41-A-1 ENGINE  
 FAR FIELD NOISE

OPERATION:

IDLE  
 54% RPM  
 FREE FLOW

IDENTIFICATIONS:

OMEGA 1.4

TEST 75-002-004

RUN 01

06 MAY 75

06 MAY 75

PAGE 22

METEOROLOGY:

TEMP = 15 C  
 BAR PRESS = .760 M HG  
 REL HUMID = 70 %

POINT DB  
 A 35  
 B 40  
 C 45  
 D 50  
 E 55  
 F 60  
 G 65  
 H 70  
 I 75  
 J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

B 40

C 45

D 50

E 55

F 60

G 65

H 70

I 75

J 80

POINT DB

A 35

FIGURE 11  
SOUND PRESSURE LEVEL (SPL)  
EQUAL LEVEL CONTOURS (DB)  
1000 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:

A-7D AIRCRAFT  
TF41-A-1 ENGINE  
FAR FIELD NOISE

OPERATION:

IDLE

54% RPM

FREE FLOW

IDENTIFICATION:

TEST 75-002-004

RUN 01

METEOROLOGY:

TEMP = 15 C

BAR PRESS = 760 M HG

REL HUMID = 70 %

DATE:

06 MAY 75

PAGE 23

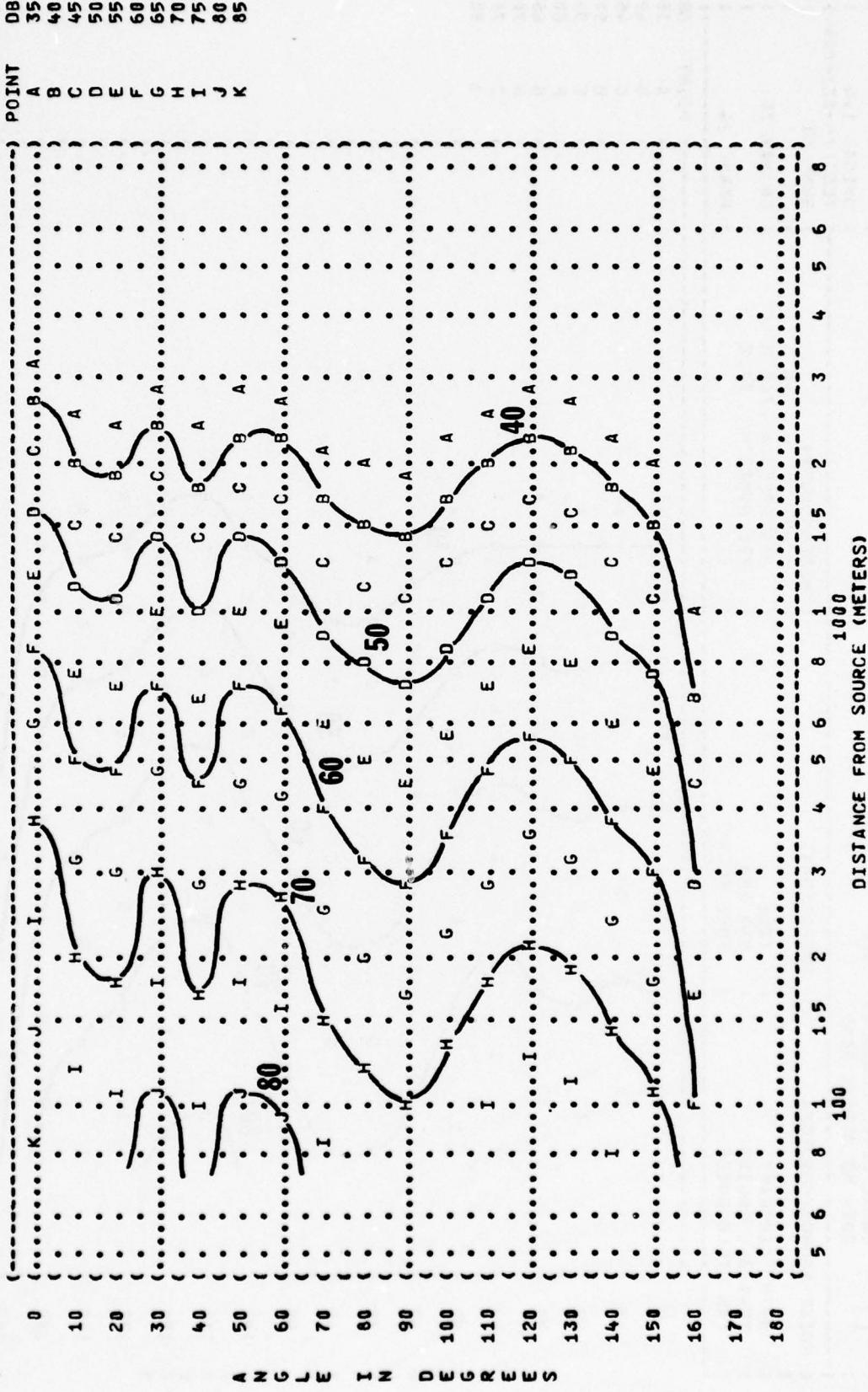


FIGURE: SOUND PRESSURE LEVEL (SPL)  
**11**  
 EQUAL LEVEL CONTOURS (DB)

NOISE SOURCE/SUBJECT:  
**A-70 AIRCRAFT**  
**TF41-A-1 ENGINE**  
**FAR FIELD NOISE**

OPERATION:  
**IDLE**  
**54% RPM**  
**FREE FLOW**

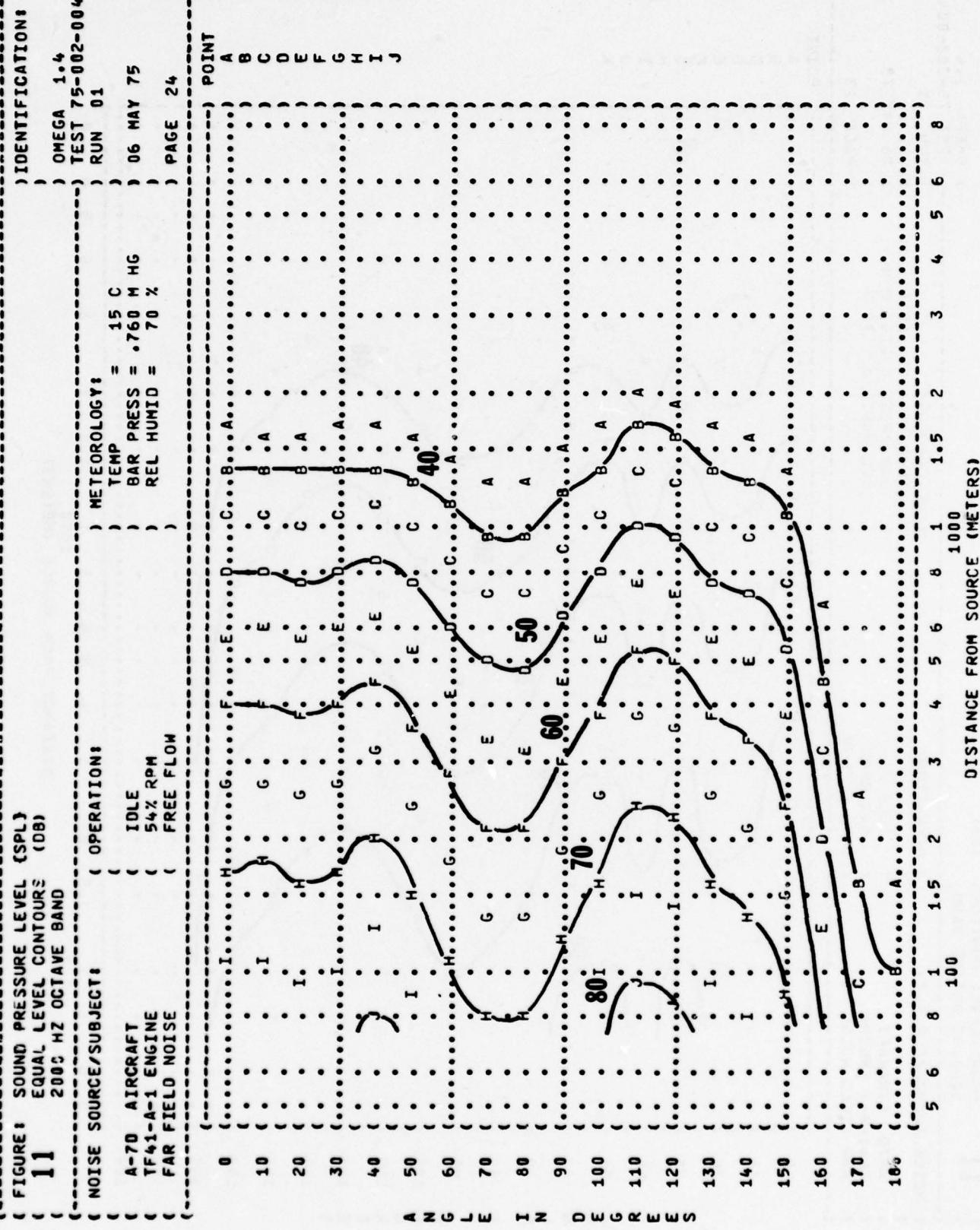


FIGURE: SOUND PRESSURE LEVEL (SPL)  
11 EQUAL LEVEL CONTOURS  
4000 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:  
A-70 AIRCRAFT  
TF41-A-1 ENGINE  
FAR FIELD NOISE

OPERATIONS:  
IDLE  
54% RPM  
FREE FLOW

METEOROLOGY:  
TEMP = 15 C  
BAR PRESS = .760 M HG  
REL HUMID = 70 %

IDENTIFICATION:  
OMEGA 1.4  
TEST 75-002-004

RUN 01

06 MAY 75

PAGE 25

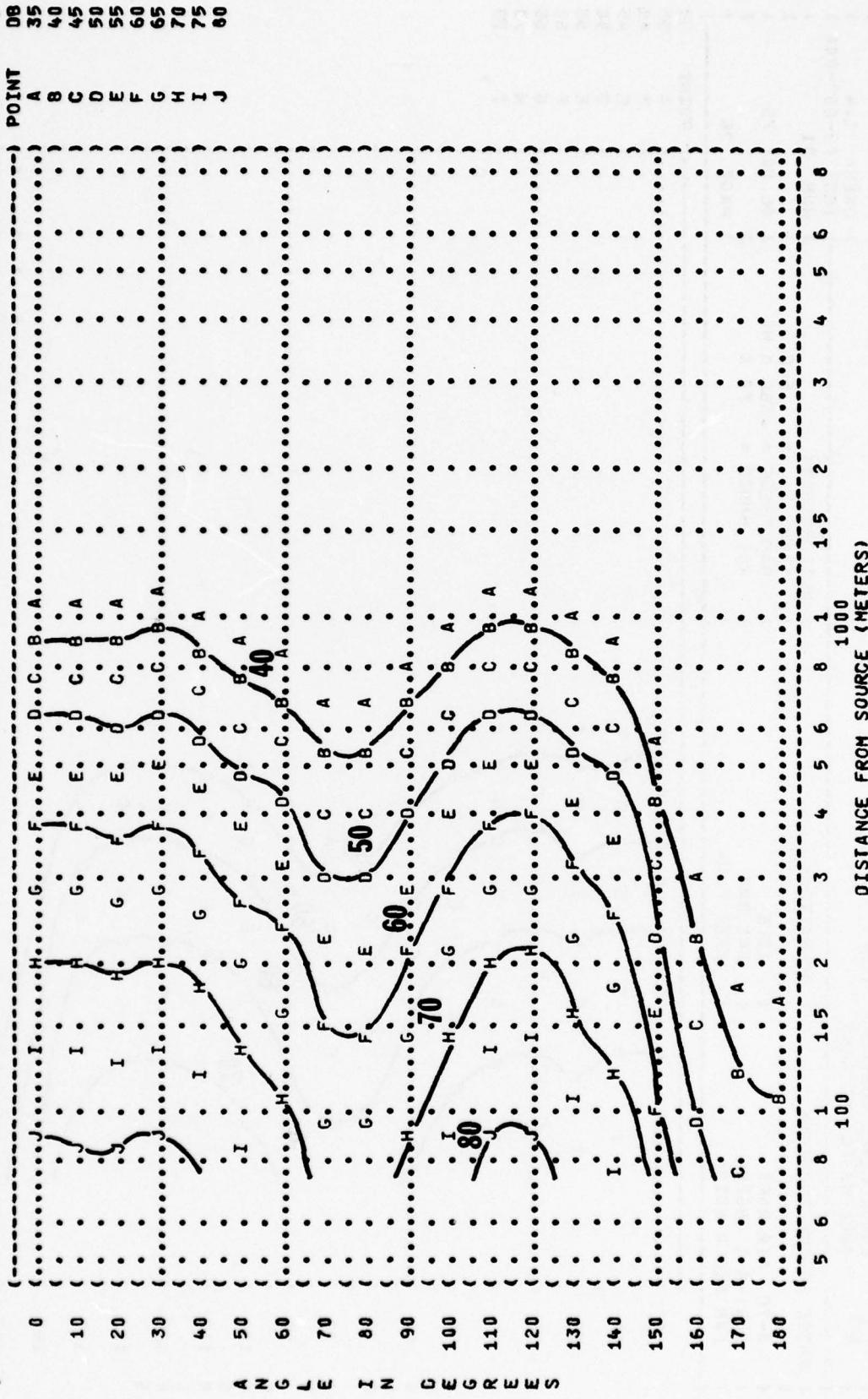


FIGURE: SOUND PRESSURE LEVEL {SPL}  
**11** EQUAL LEVEL CONTOURS {DB}  
 8000 HZ OCTAVE BAND

NOISE SOURCE/SUBJECT:

A-7D AIRCRAFT  
 TF41-A-1 ENGINE  
 FAR FIELD NOISE

OPERATION:

IDLE  
 54% RPM  
 FREE FLOW

METEOROLOGY:  
 TEMP = 15 C  
 BAR PRESS = .760 M HG  
 REL HUMID = 70 %  
 PAGE 26

IDENTIFICATIONS:  
 OMEGA 1.4  
 TEST 75-002-004  
 RUN 01

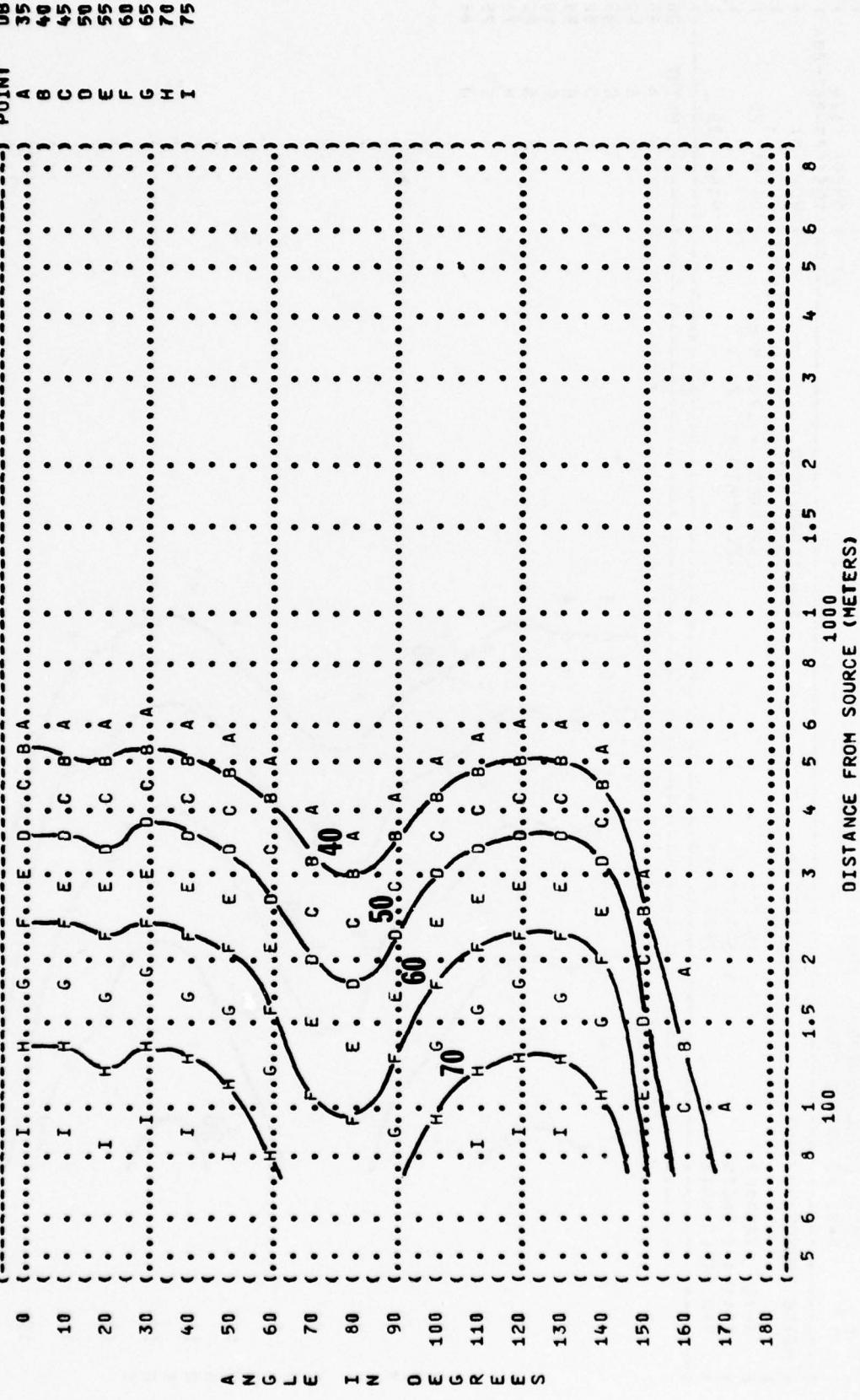


FIGURE: SOUND PRESSURE LEVEL (SPL)  
**11** EQUAL LEVEL CONTOURS (DB)  
 31.5 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:  
 A-70 AIRCRAFT  
 TF41-A-1 ENGINE  
 FAR FIELD NOISE

OPERATION:  
 85% RPM  
 FREE FLOW

IDENTIFICATION:  
 OMEGA 1.4  
 TEST 75-002-004  
 RUN 02  
 06 MAY 75  
 PAGE 18

METEOROLOGY:  
 TEMP = 15 C  
 BAR PRESS = .760 HG  
 REL HUMID = 70 %

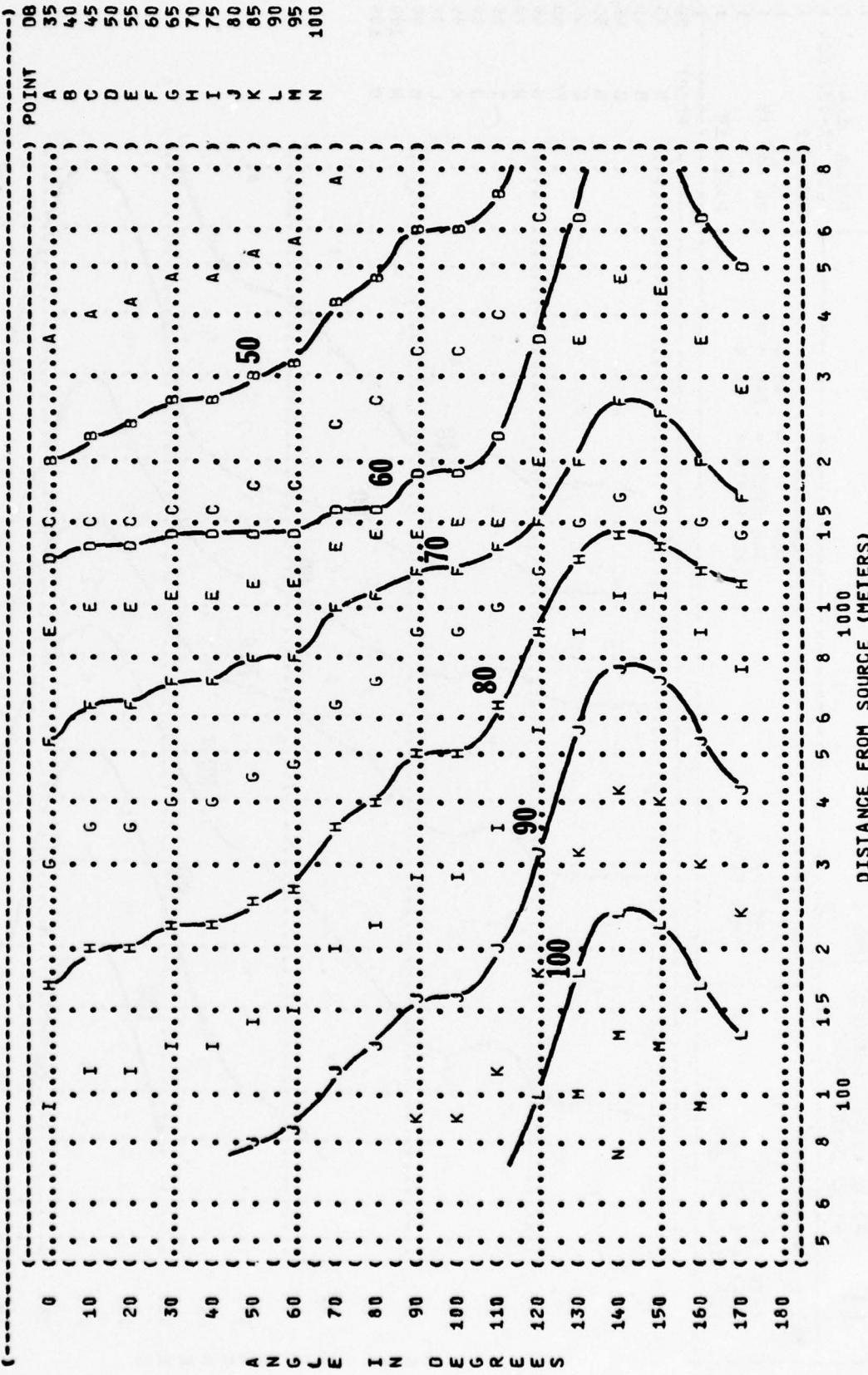


FIGURE 11 SOUND PRESSURE LEVEL (SPL) EQUAL LEVEL CONTOURS (DB)

63 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:

A-7D AIRCRAFT  
TF41-A-1 ENGINE  
FAR FIELD NOISE

OPERATION:

85% RPM  
FREE FLOW

IDENTIFICATION:  
OMEGA 1.4  
TEST 75-002-004  
RUN 02  
PAGE 19

METEOROLOGY:

TEMP = 15 C  
BAR PRESS = .760 M HG  
REL HUMID = 70 %

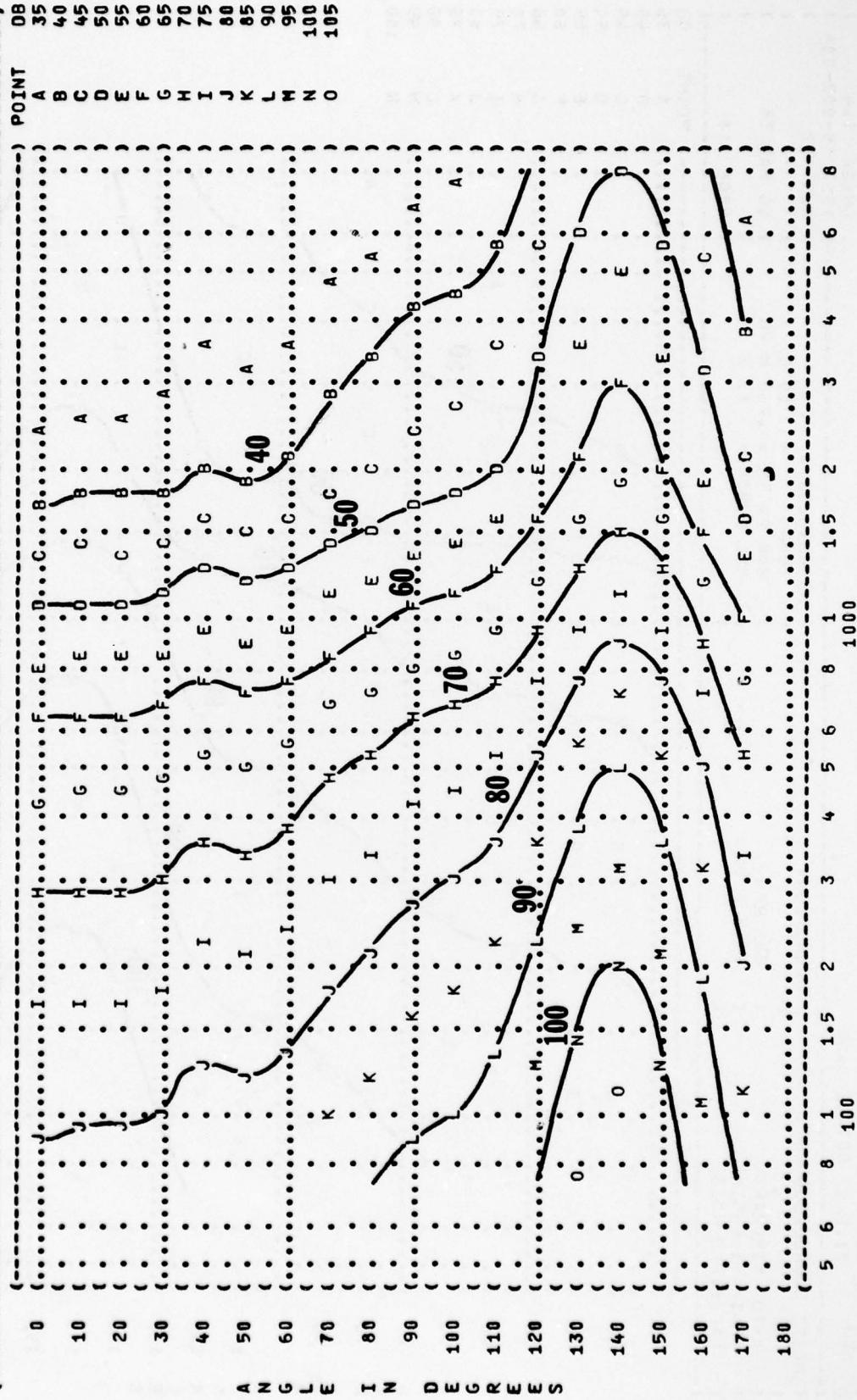


FIGURE 11 SOUND PRESSURE LEVEL (SPL)  
 11 EQUAL LEVEL CONTOURS (DB)  
 125 HZ OCTAVE BAND

NOISE SOURCE/SUBJECT:

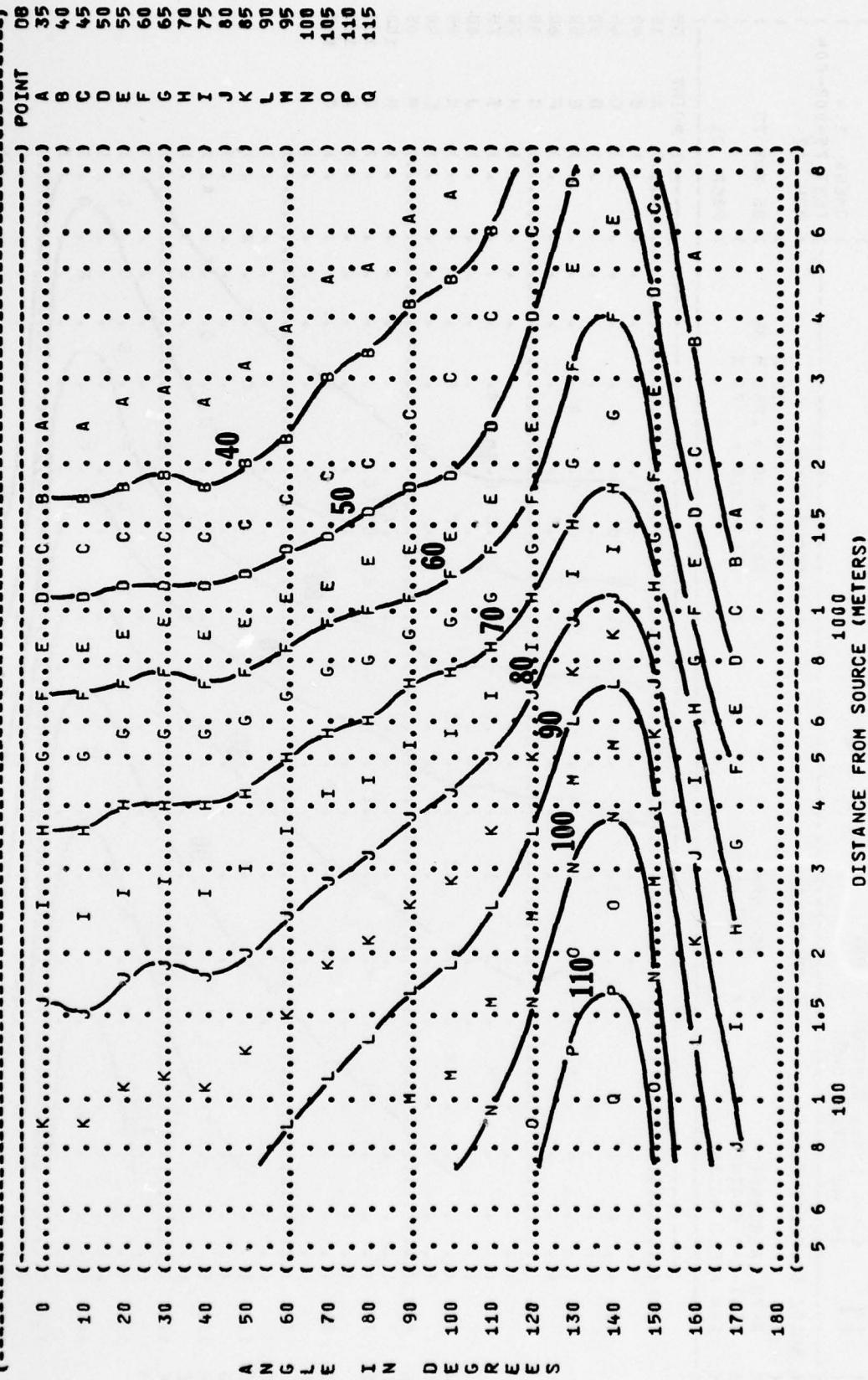
A-70 AIRCRAFT  
 TF41-A-1 ENGINE  
 FAR FIELD NOISE

OPERATION:

85% RPM  
 FREE FLOW

IDENTIFICATION:  
 OMEGA 1-4  
 TEST 75-002-004  
 RUN 02

METEOROLOGY:  
 TEMP = 15 C  
 BAR PRESS = .760 M HG  
 REL HUMID = 70 %  
 PAGE 20





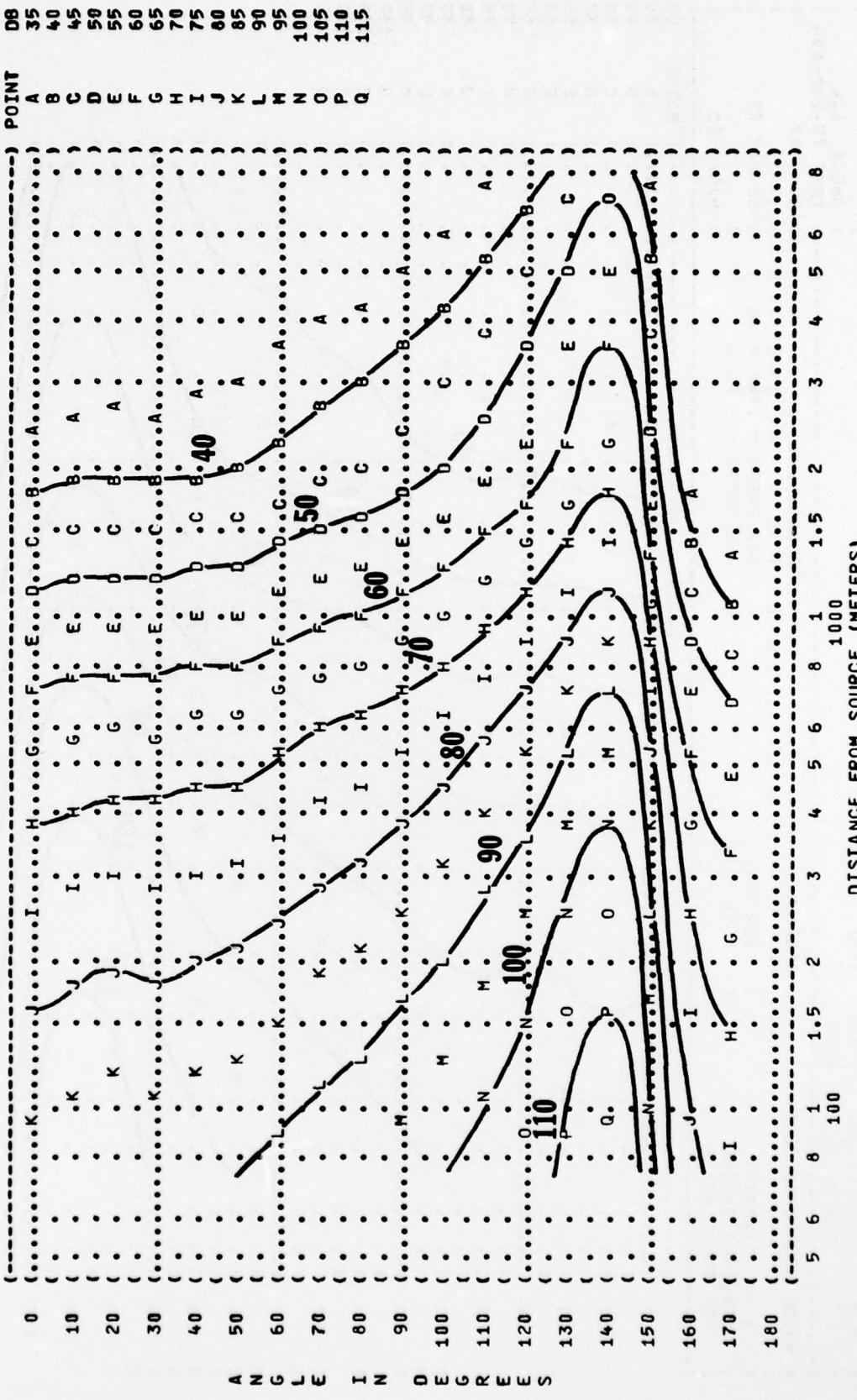
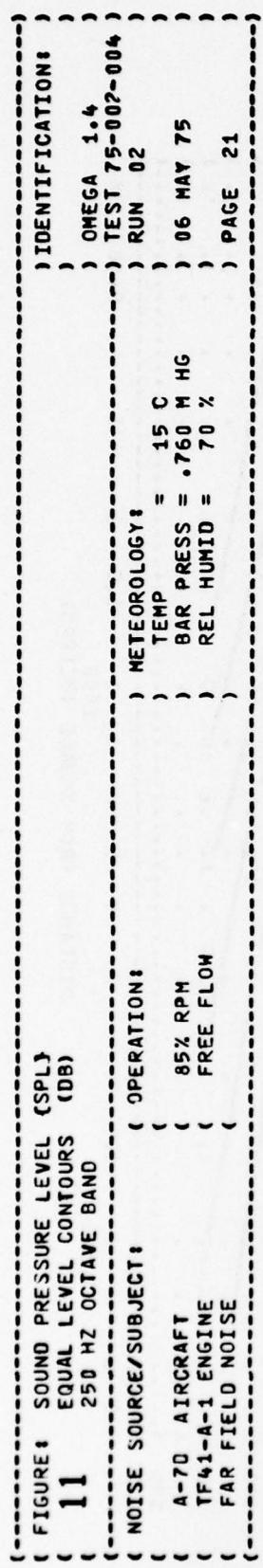
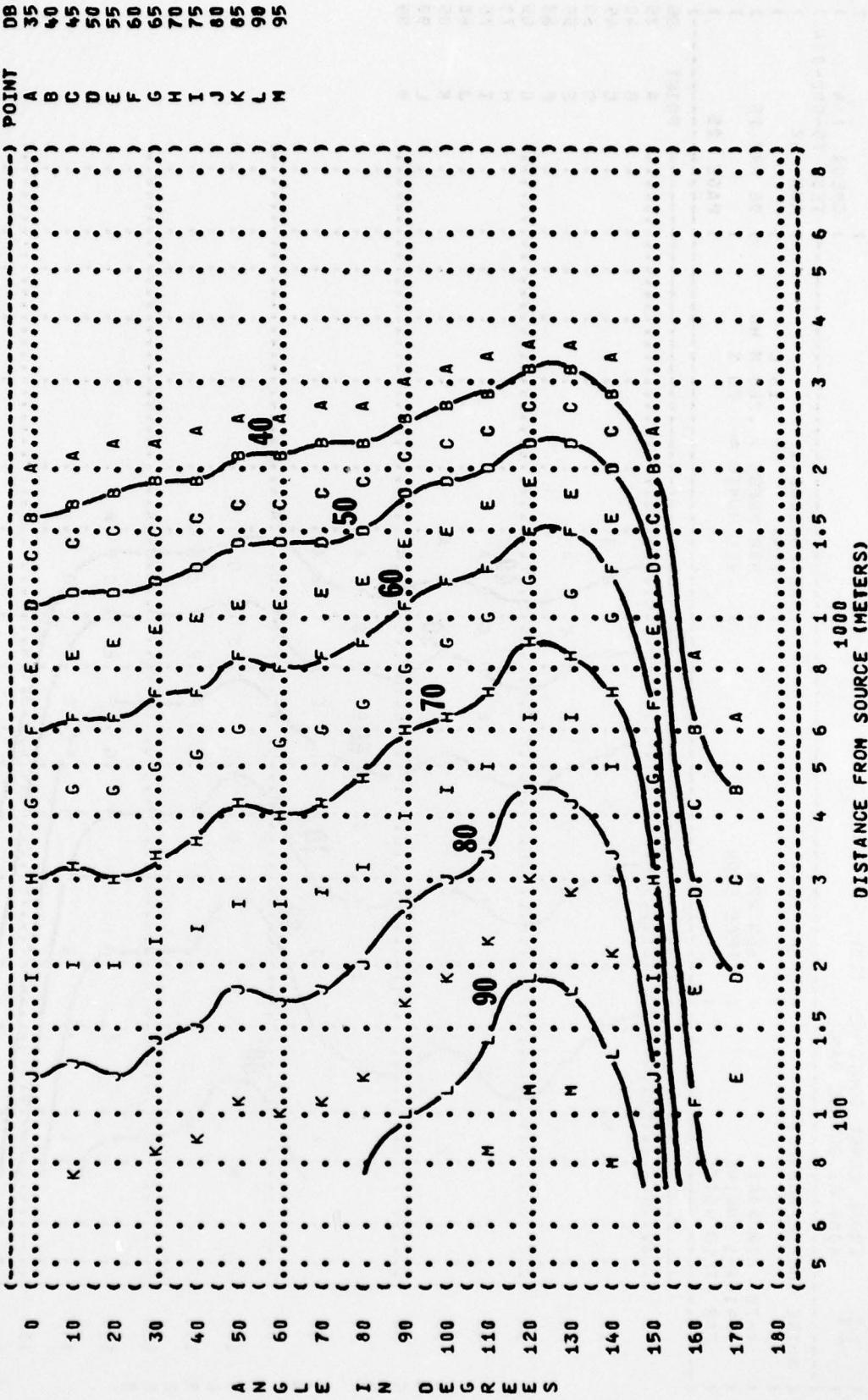




FIGURE: SOUND PRESSURE LEVEL (SPL)  
**11**  
 EQUAL LEVEL CONTOURS (DB)  
 2000 Hz OCTAVE BAND  
 NOISE SOURCE/SUBJECT:  
 A-70 AIRCRAFT  
 TF41-A-1 ENGINE  
 FAR FIELD NOISE

OPERATION:  
 85% RPM  
 FREE FLOW  
 METEOROLOGY:  
 TEMP = 15 C  
 BAR PRESS = .760 M HG  
 REL HUMID = 70 %  
 IDENTIFICATION:  
 OMEGA 1.4  
 TEST 75-002-004  
 RUN 02  
 PAGE 24



DISTANCE FROM SOURCE (METERS)

FIGURE 1 SOUND PRESSURE LEVEL (SPL)  
11 EQUAL LEVEL CONTOURS (DB)  
4000 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:  
A-7D AIRCRAFT  
TF41-A-1 ENGINE  
FAR FIELD NOISE

OPERATION:  
85% RPM  
FREE FLOW

IDENTIFICATION:

OMEGA 1.4  
TEST 75-002-004  
RUN 02

METEOROLOGY:  
TEMP = 15 C  
BAR PRESS = .760 M HG  
REL HUMID = 70 %

PAGE 25

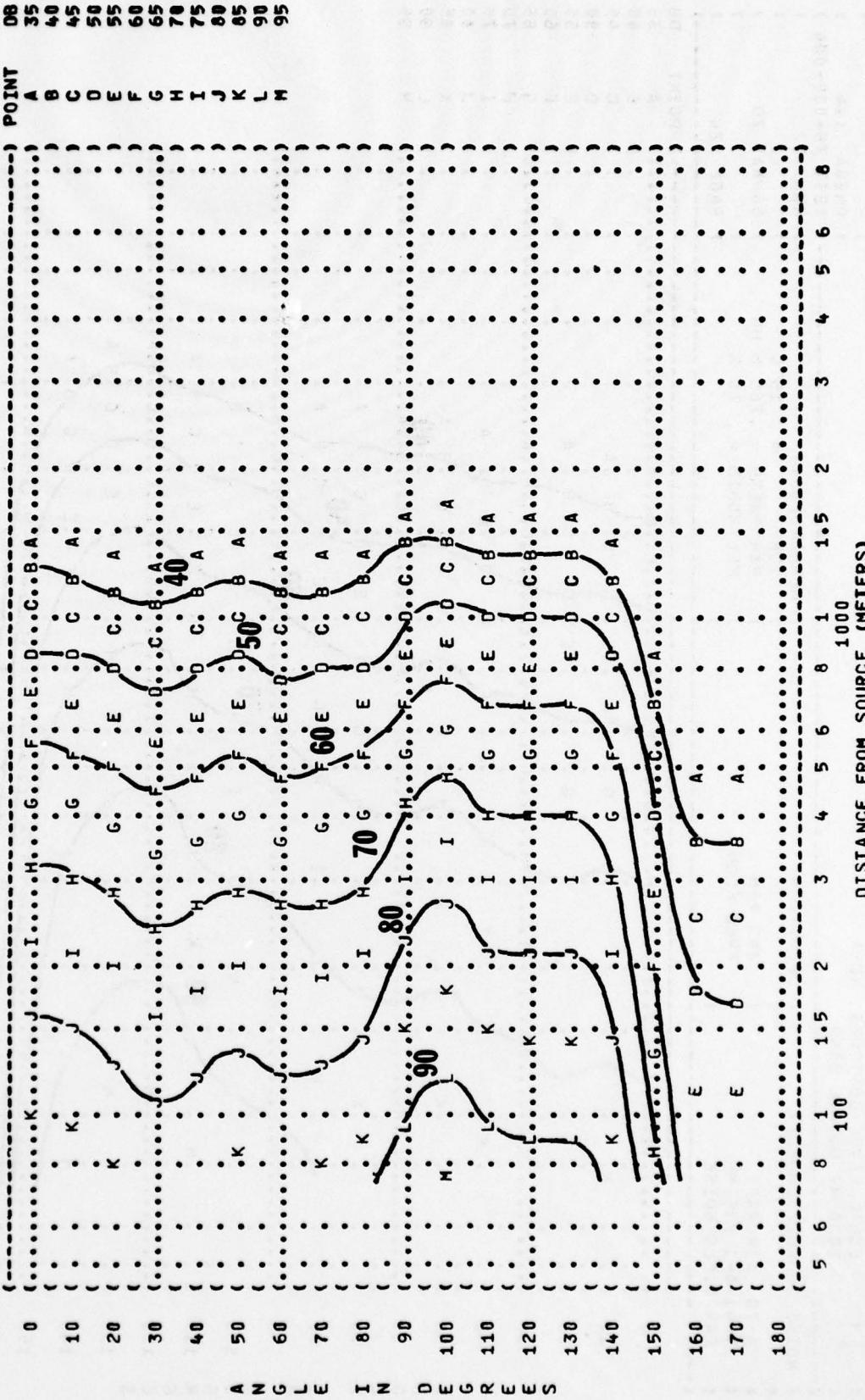


FIGURE: SOUND PRESSURE LEVEL (SPL)  
 11 EQUAL LEVEL CONTOURS (DB)  
 8000 HZ OCTAVE BAND

NOISE SOURCE/SUBJECT: A-70 AIRCRAFT  
 TF41-A-1 ENGINE  
 FAR FIELD NOISE

OPERATION: 85% RPM  
 FREE FLOW

METEOROLOGY: TEMP = 15 C  
 BAR PRESS = .760 M HG  
 REL HUMID = 70 %  
 TEST 75-002-004  
 RUN 02  
 06 MAY 75  
 PAGE 26

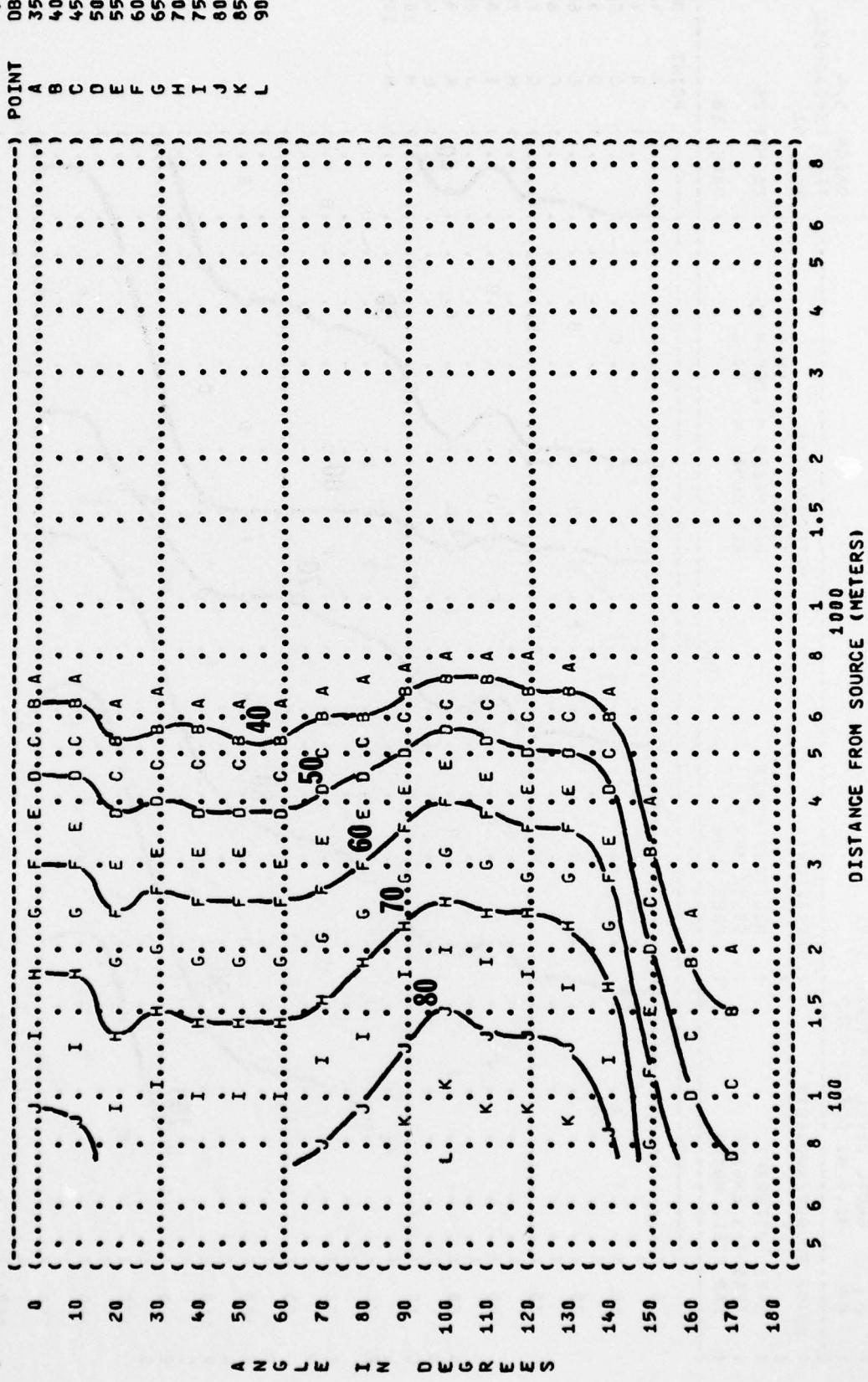


FIGURE 1 SOUND PRESSURE LEVEL (SPL)  
11 EQUAL LEVEL CONTOURS (DB)  
31.5 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:  
A-70 AIRCRAFT  
TF41-A-1 ENGINE  
FAR FIELD NOISE

OPERATION:  
MILITARY POWER  
99.5% RPM  
FREE FLOW

METEOROLOGY  
TEMP = 15 C  
BAR PRESS = .760 M HG  
REL HUMID = 70 %  
PAGE 18

IDENTIFICATION:  
OMEGA 1-4  
TEST 75-002-051  
RUN 01

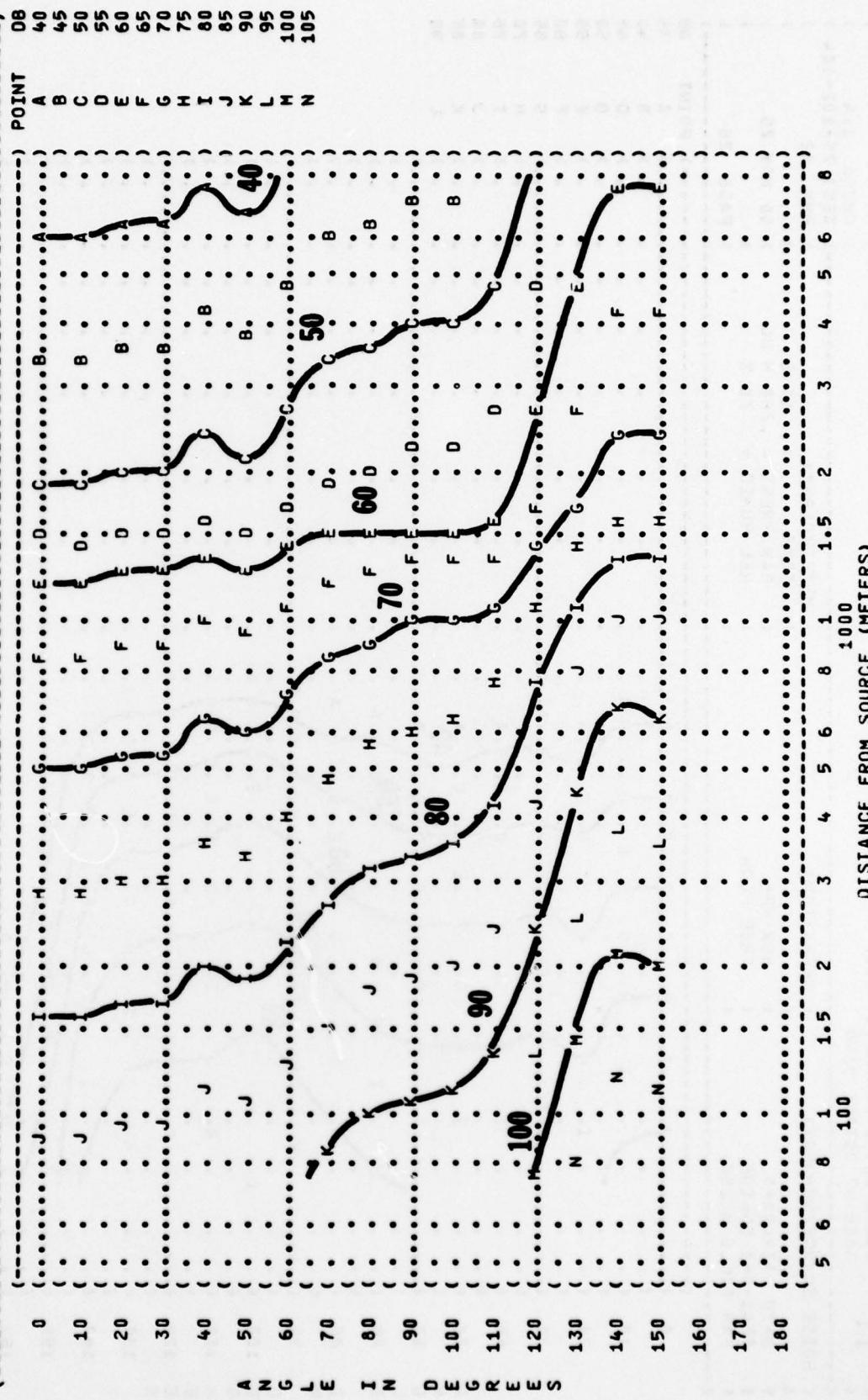


FIGURE 1 SOUND PRESSURE LEVEL (SPL)  
11 EQUAL LEVEL CONTOURS (DB)  
63 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:

A-7D AIRCRAFT  
TF41-A-1 ENGINE  
FAR FIELD NOISE

OPERATION:

MILITARY POWER  
99.5% RPM  
FREE FLOW

IDENTIFICATION:

OMEGA 1.4

TEST 75-002-051

RUN 01

20 MAY 75

REL HUMID = 70 %

PAGE 19

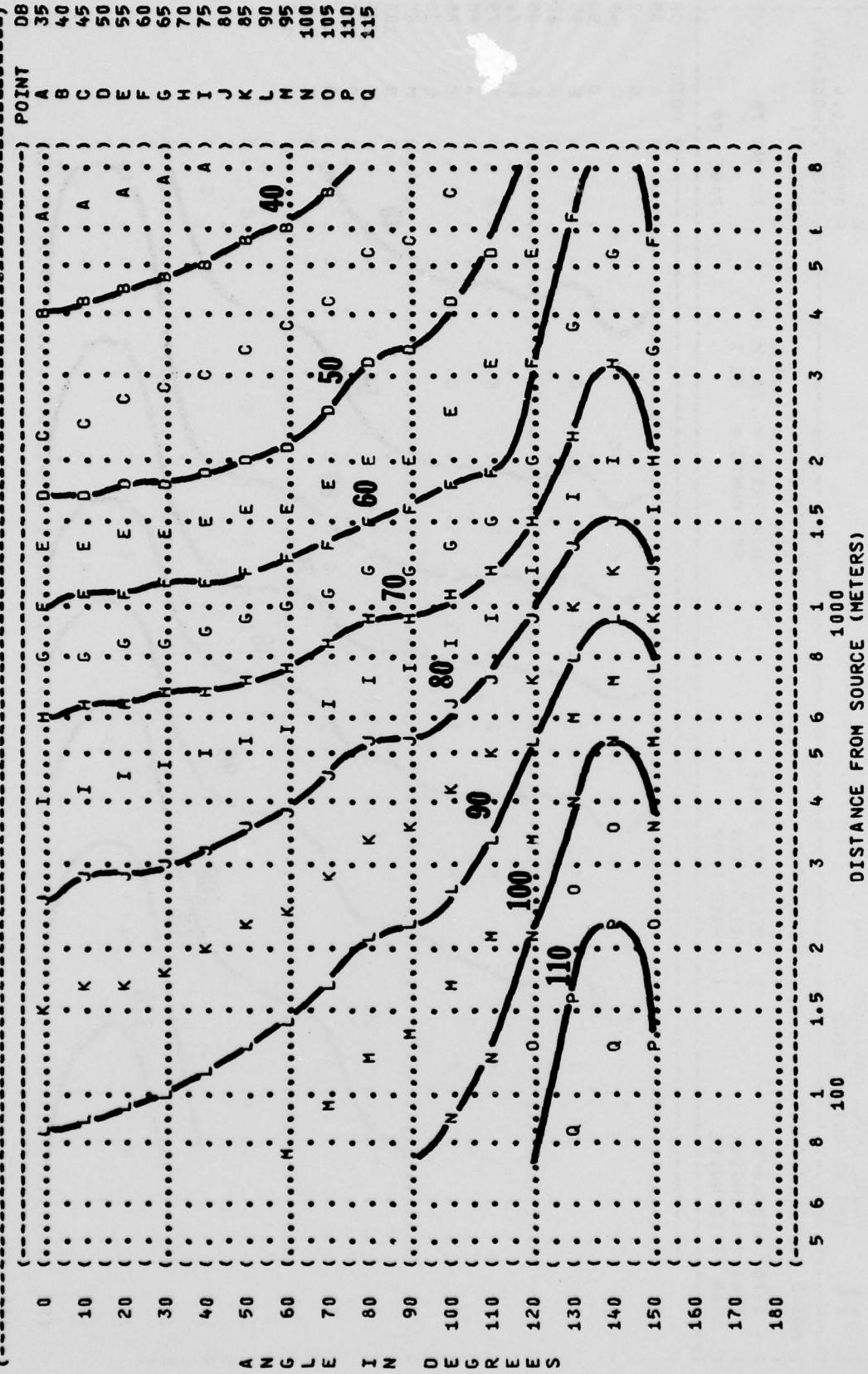


FIGURE 11  
SOUND PRESSURE LEVEL (SPL)  
EQUAL LEVEL CONTOURS (DB)

NOISE SOURCE/SUBJECT:

A-7D AIRCRAFT  
TF41-A-1 ENGINE  
FAR FIELD NOISE

OPERATION:

MILITARY POWER  
99.5% RPM  
FREE FLOW

IDENTIFICATION:  
OMEGA 1-4  
TEST 75-002-051  
RUN 01

METEOROLOGY:  
TEMP = 15 C  
BAR PRESS = .760 M HG  
REL HUMID = 70 %

DATE: 20 MAY 75  
PAGE 20

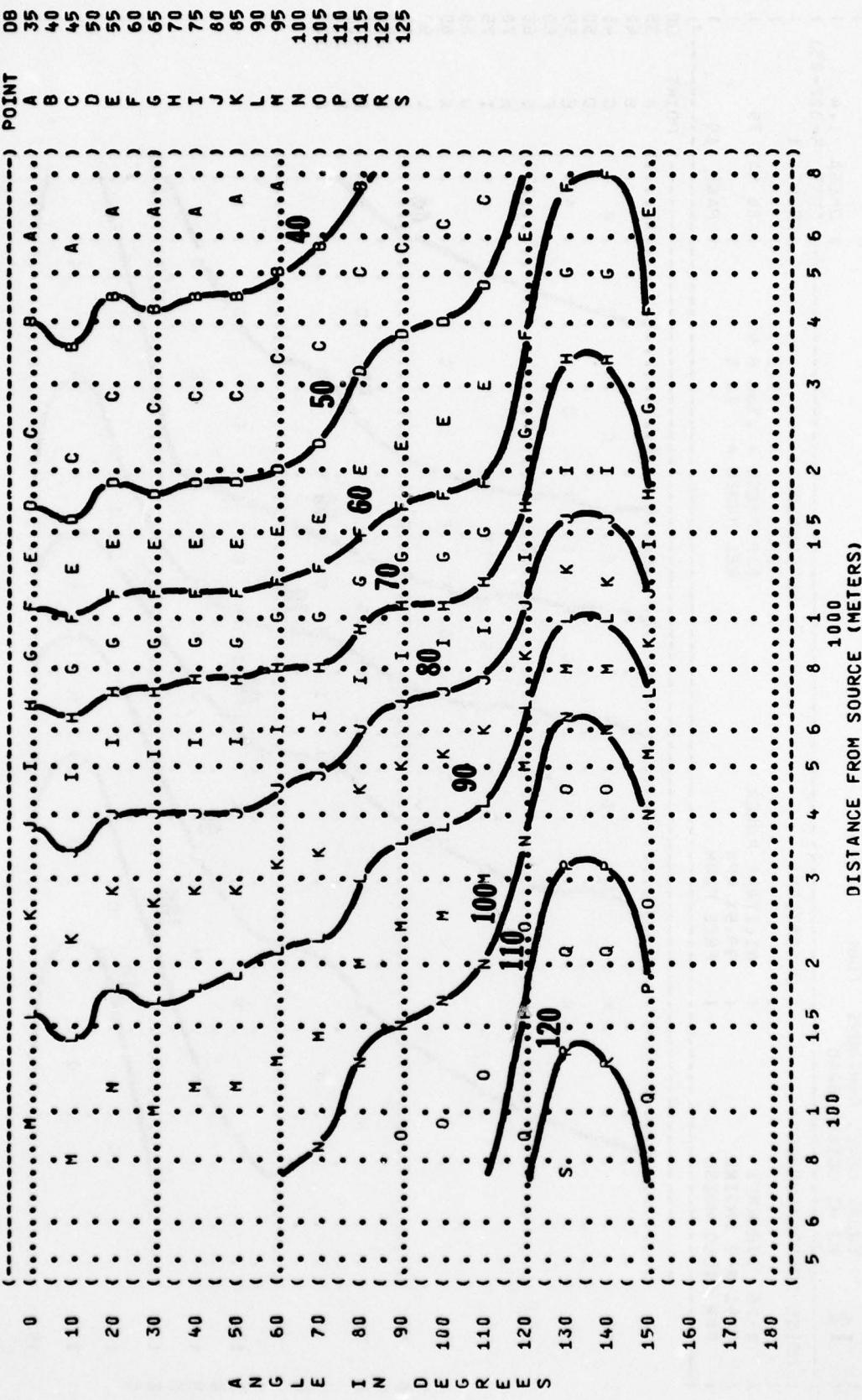


FIGURE: SOUND PRESSURE LEVEL {SPL}  
**11** EQUAL LEVEL CONTOURS (DB)  
 250 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:  
 A-7D AIRCRAFT  
 TF41-A-1 ENGINE  
 FAR FIELD NOISE

OPERATION:

MILITARY POWER  
 99.5% RPM  
 FREE FLOW

IDENTIFICATION:

CMEGA 1.4  
 TEST 75-002-051  
 RUN 01

20 MAY 75

METEOROLOGY:  
 TEMP = 15 C  
 BAR PRESS = 760 M HG  
 REL HUMID = 70 %

PAGE 21

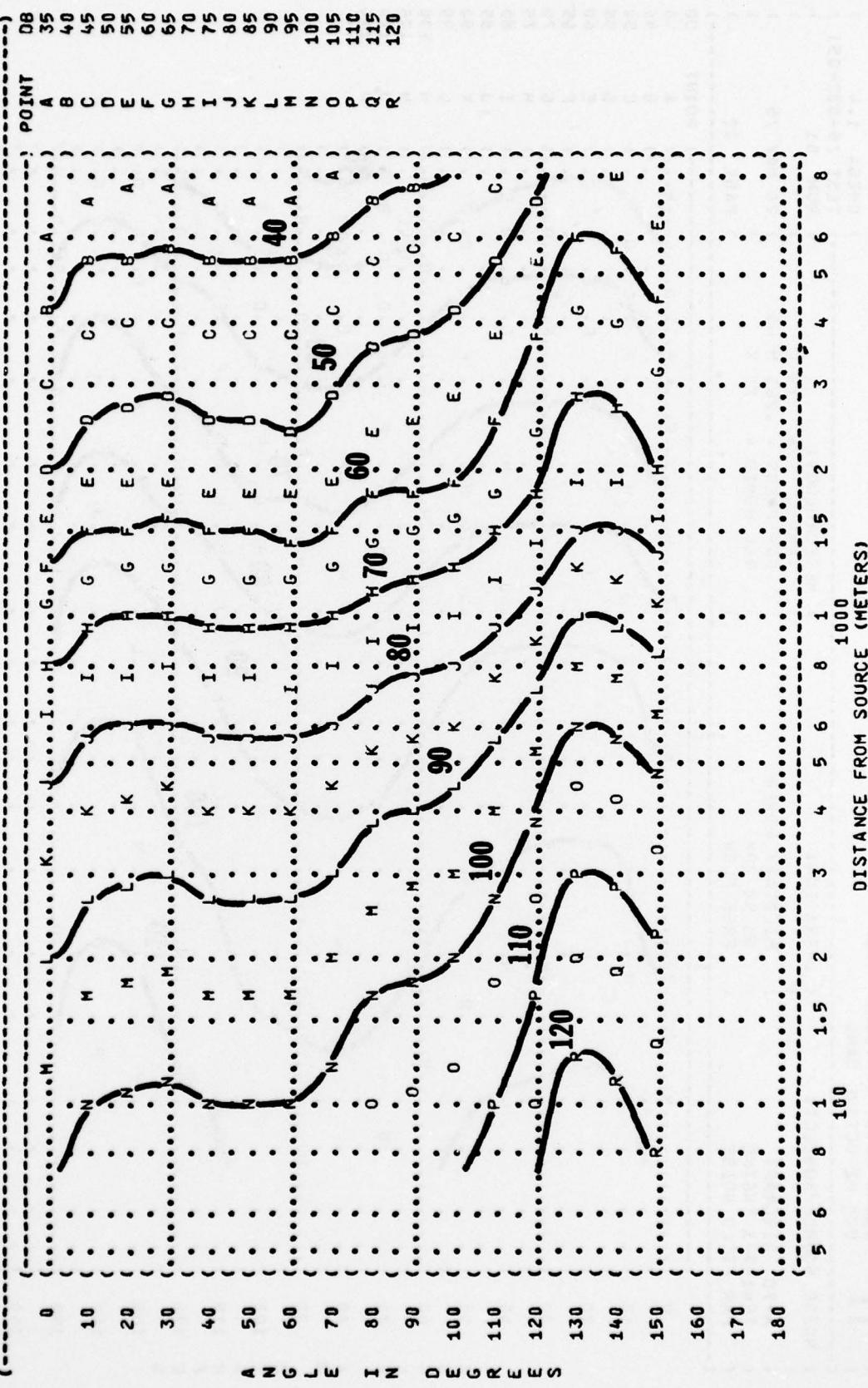


FIGURE: SOUND PRESSURE LEVEL (SPL)  
**11** EQUAL LEVEL CONTOURS (DB)  
 500 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT:  
 A-70 AIRCRAFT  
 TF41-A-1 ENGINE  
 FAR FIELD NOISE

OPERATION:  
 MILITARY POWER  
 99.5% RPM  
 FREE FLOW

IDENTIFICATION:  
 OMEGA 1.4  
 TEST 75-002-051  
 RUN 01  
 PAGE 22

METEOROLOGY:  
 TEMP = 15 C  
 BAR PRESS = 760 MM HG  
 REL HUMID = 70 %

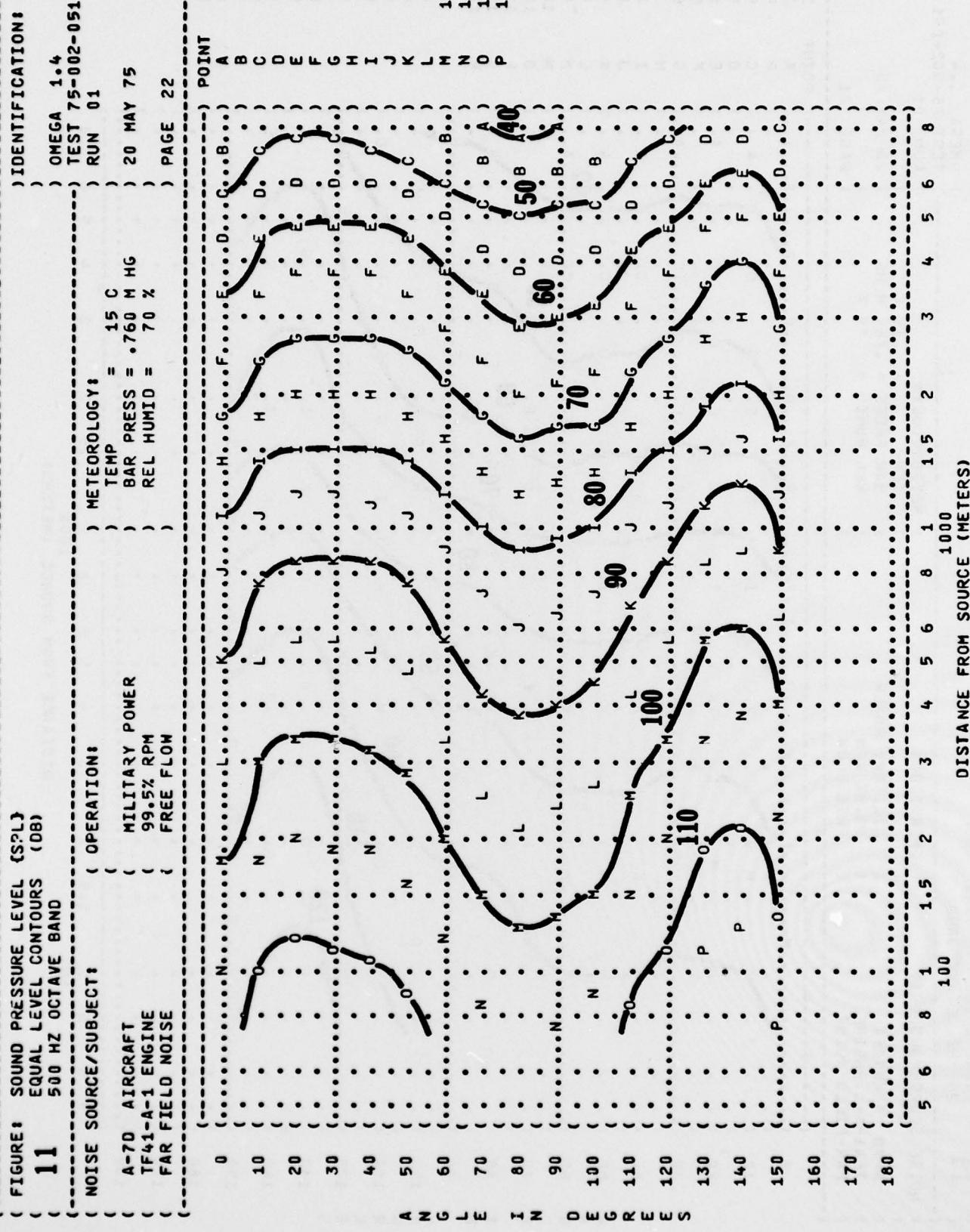


FIGURE: SOUND PRESSURE LEVEL (SPL)  
**11** EQUAL LEVEL CONTOURS (DB)  
 1000 Hz OCTAVE BAND

NOISE SOURCE/SUBJECT: **A-70 AIRCRAFT  
 TF41-A-1 ENGINE  
 FAR FIELD NOISE**

OPERATION: **MILITARY POWER  
 99.5% RPM  
 FREE FLOW**

METEOROLOGY: **TEMP = 15 C  
 BAR PRESS = .760 M HG  
 REL HUMID = 70 %**

TEST 75-002-051  
 RUN 01  
 PAGE 23

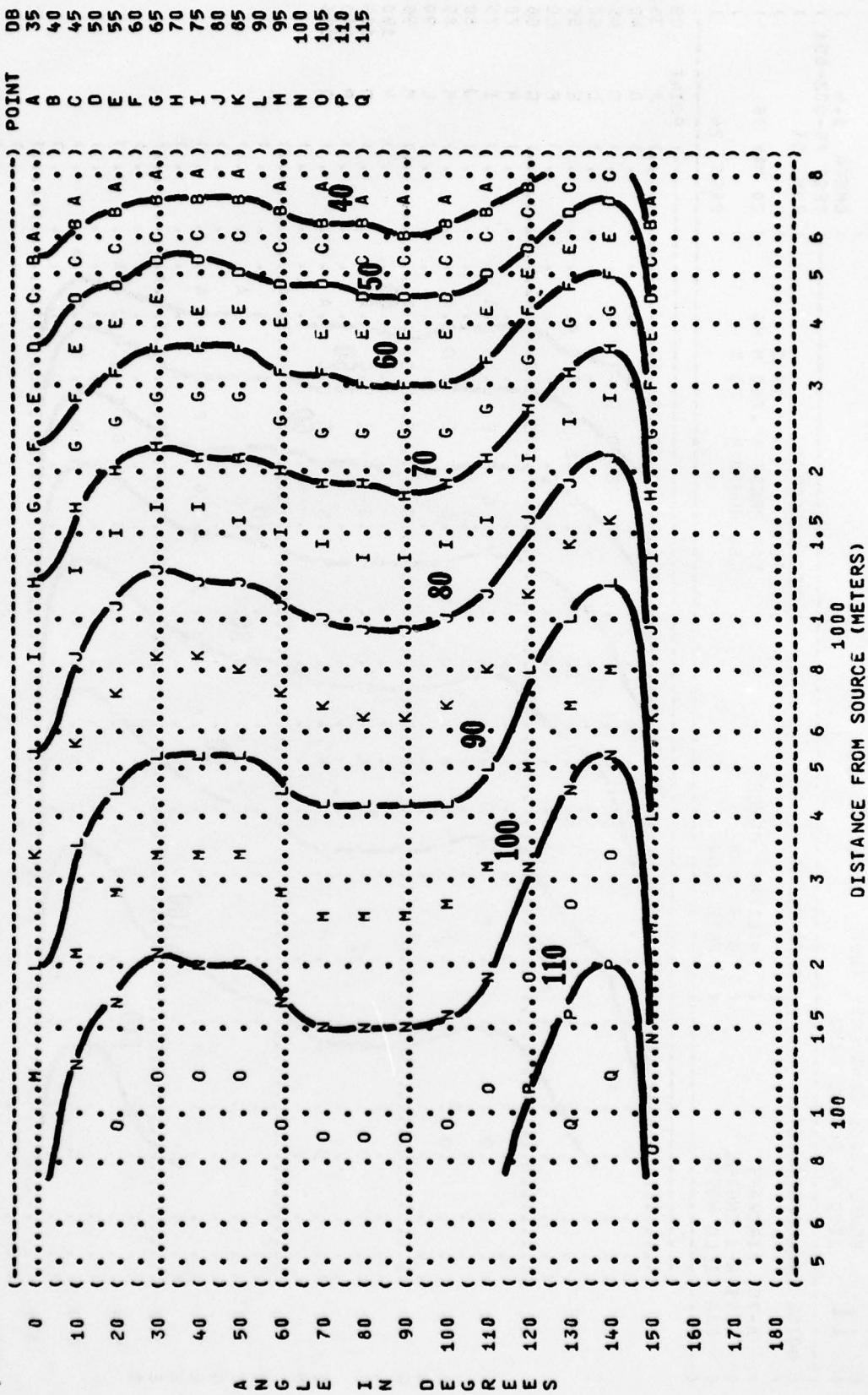


FIGURE 11  
SOUND PRESSURE LEVEL (SPL)  
EQUAL LEVEL OCTAVE BAND

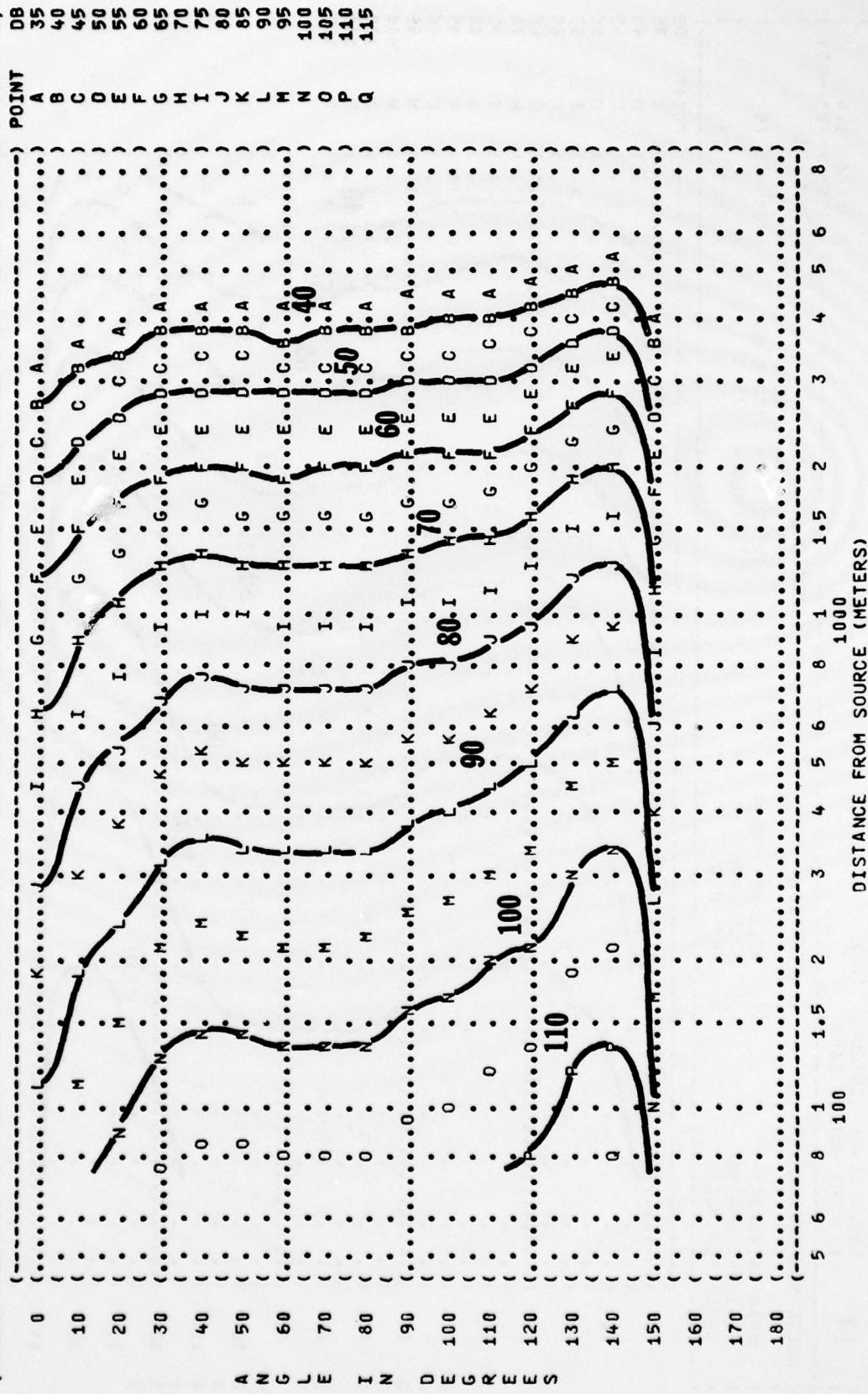
NOISE SOURCE/SUBJECT: A-70 AIRCRAFT  
TF41-A-1 ENGINE  
FAR FIELD NOISE

OPERATIONS:  
MILITARY POWER  
99.5% RPM  
FREE FLOW

METEOROLOGY:  
TEMP = 15°C  
BAR PRESS = .760 M HG  
REL HUMID = 70%

IDENTIFICATION:  
OMEGA 1<sup>4</sup>  
TEST 75-002-051  
RUN 01

DATE: 20 MAY 75  
PAGE 24



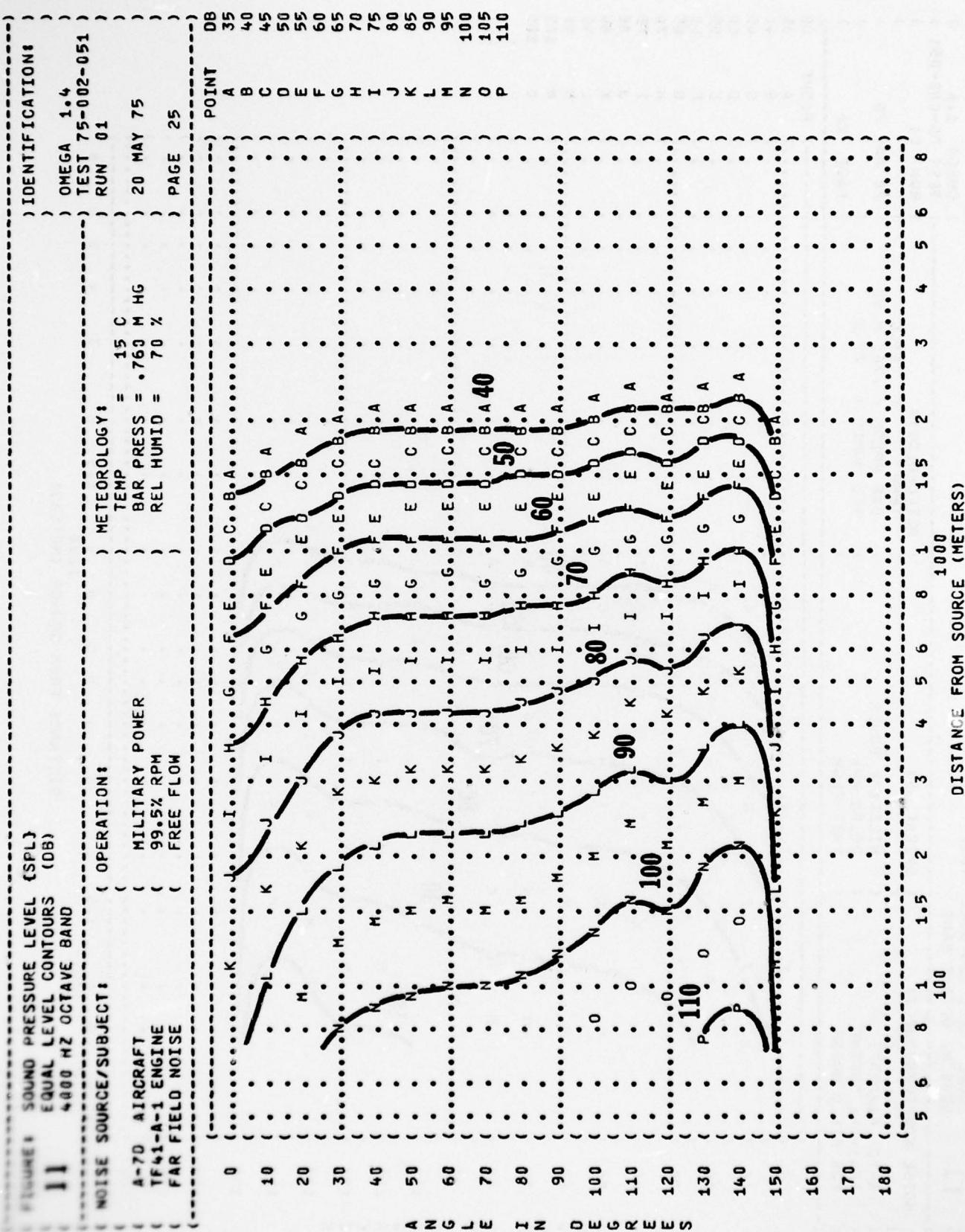


FIGURE: SOUND PRESSURE LEVEL (SPL)  
11 EQUAL LEVEL OCTAVE BAND  
8000 Hz OCTAVE BAND

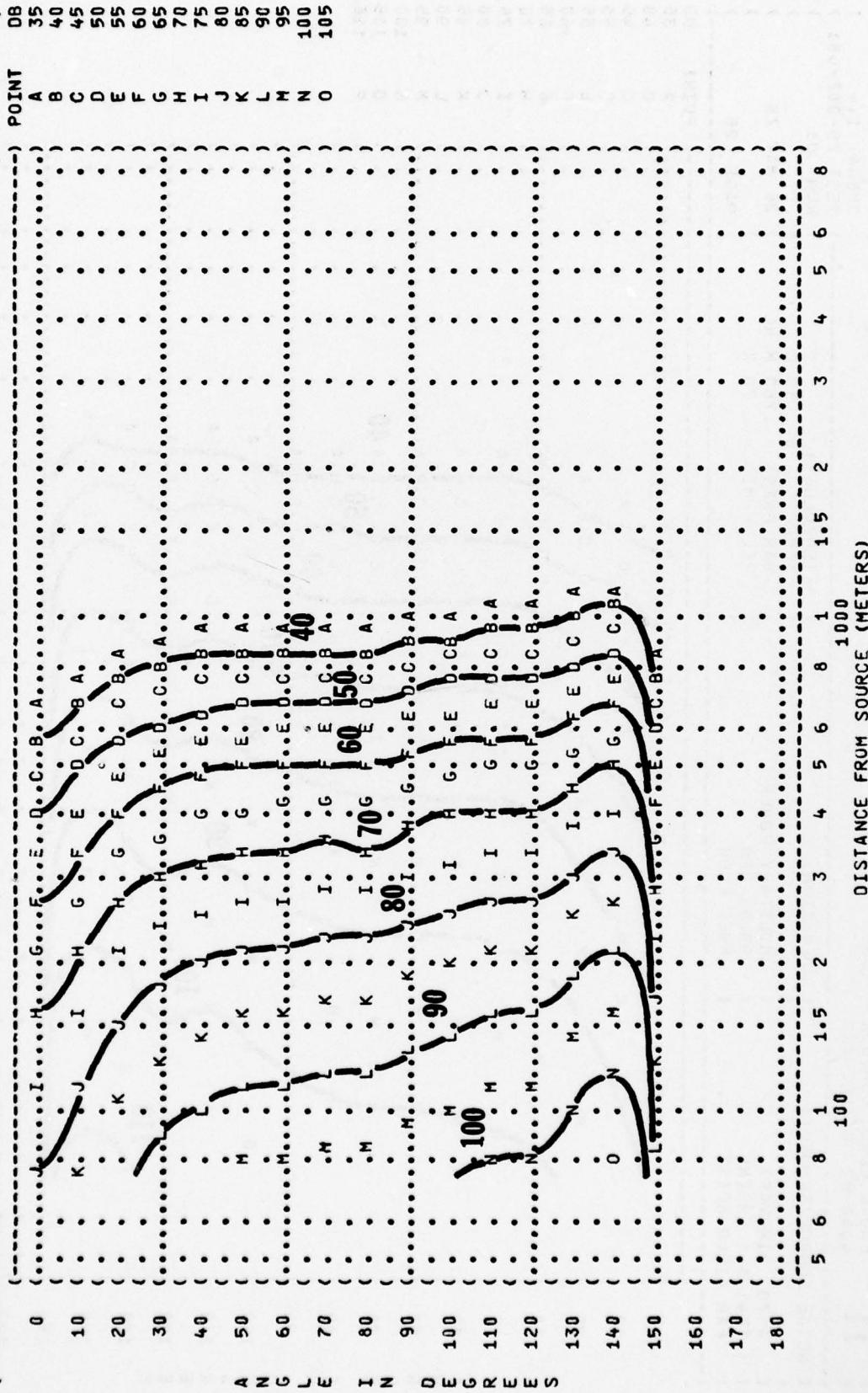
NOISE SOURCE/SUBJECT:  
A-70 AIRCRAFT  
TF41-A-1 ENGINE  
FAR FIELD NOISE

OPERATION:  
MILITARY POWER  
99.5% RPM  
FREE FLOW

IDENTIFICATION:  
OMEGA 1•4  
TEST 75-002-051  
RUN 01

METEOROLOGY:  
TEMP = 15 C  
BAR PRESS = .760 M HG  
REL HUMID = 70 %

PAGE 26



DISTANCE FROM SOURCE (METERS)